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Paper Industry Experiences Irregular Year

Although Pulp and Paper Production Again Broke All Preceding Records During 1929, Over-Production and Consequent Severe Competition for Orders Resulted In Unstable Price Conditions in Some Branches of Industry—Fine Paper Division, However, Enjoyed Profitable and Satisfactory Year and Proved Notable Exception

By H. J. Laughton, Associate Editor of the Paper Trade Journal

TOTAL volume of business in the paper industry during the past year broke all preceding records and was 6.5 per cent higher than in 1928, although conditions in general were materially affected in the closing months of the year by the stock exchange debacle in November. While some sections of the industry enjoyed a profitable year, notably the fine paper division, over-production of news print, book papers, kraft paper, and boards, resulted in keen competition for orders and considerable price cutting.

Paper Output Expands

The statistical department of the American Paper and Pulp Association estimates the production of paper in 1929 at no less than 10,964,000 tons. The productive capacity during 1929 totaled about 13,800,000 tons, so that 1929 production was at the rate of 79 per cent of capacity, leaving 21 per cent of the capacity idle. In 1928 about 22 per cent of the productive capacity was idle.

During 1929, about 1,400 tons of daily capacity were added to the industry, the greatest proportion being in the wrapping paper section. The following is a comparison of production and capacity during the past five years:

Year	Production	Capacity	Per cent idle
1929	10,964,000	13,800,000	21
1928	10,403,000	13,300,000	22
1927	10,002,000	12,536,000	20
1926	9,750,000	12,000,000	19
1925	9,182,200	11,254,500	18

The wood pulp production in 1929 was 4,641,000 tons, consisting of sulphite, 1,635,000 tons; kraft, 836,000 tons; soda, 510,000 tons, and ground wood, 1,640,000 tons.

Capacity Continues to Increase

According to reports received from paper making machinery manufacturers, 27 new machines, with a daily capacity of 1,381 tons were installed in the United States in 1929. These machines represent an increase in capacity for the paper industry as a whole of 428,000 tons. In addition to this, there were numerous increases in capacity by improvements and betterments in existing machines and improvements in operating speed. The increase in capacity in 1929, therefore, may be conservatively estimated at around 500,000 tons.

Exports Reach Record Mark

Exports of paper and paper products from the United States during 1929 again reached a record mark, with a valuation of $37,379,685, thus surpassing the previous year's high figure by $6,447,000, or 20 per cent, according to the Paper Division of the Department of Commerce. These exports have maintained a consistent rise from month to month as compared with the preceding year's that characterized the 1928 shipments, the last quarter's exports in 1929 exceeding those of the corresponding quarter in 1928 by 12 per cent, while the valuation of the December shipments surpassed those of the same month in 1928 by 17 per cent.

Printing papers shared with building boards the distinction of having registered the most outstanding gains during the past year. Exports of news print rose from 27,779,900 pounds in 1928 to 37,391,900 pounds last year, and notwithstanding a slump during the spring and summer months, maintained a consistent lead over the corresponding period in 1928. The last quarter's shipments were the heaviest of the year, exceeding those of the preceding three months and also of the corresponding quarter in 1928 by 70 per cent.

Financial Situation Favorable

Secretary of the Treasury Andrew W. Mellon sees nothing in the present business situation that warrants pessimism. He states that in the credit situation the trend of money rates is downward. He further declares "There is plenty of credit available and we have reason to expect that the rates for new capital in building construction and expansion will be such as to facilitate the promotion and accomplishment of new undertakings. Statements from the executives of railroad, public utility and industrial concerns during the President's recent conferences were, without exception, to the effect that their expenditures for new construction and expansion in 1930 will be as much, or more, than in 1929. The Government's finances are in a sound condition, and the Government, itself, is in a position to do its part in helping to meet and solve the problems which are ahead."

Mr. Mellon said further: "Forecasting the future course of business can never be done with any certainty that it will be borne out by subsequent events. No one can fully appraise the complex forces which are always at work and it is hazardous to attempt to do so. I see nothing, however, in the present situation that is either menacing or warrants pessimism. During the winter months there may be some slackness or unemployment, but hardly more than is usual at this season of the year. I have every confidence that there will be a revival of activity in the spring,

and that during the year 1930 the country will make steady progress."

Forecast for 1930

A recent survey of business prospects in the paper industry conducted by the American Paper and Pulp Association, indicates continuation of business in 1930 along essentially the same lines as 1929. While the prospects for a continued increase in volume are not promising, it is believed that the volume for 1930 will probably equal that of 1929.

Expenditures for plant improvements and maintenance in 1930 approximating normal expenditures for recent years are indicated by reports from affiliated and grade associations to the association. A marked decrease in expenditures for the building of new productive facilities, however, is also revealed. This is looked upon as favorable rather than unfavorable because of the present over-produced condition of the industry.

An over-production capacity of approximately 25 per cent exists in the paper industry. This excess, when viewed in connection with the rapid rise in consumption of paper in the United States during the past decade, evidences the fact that expansion has been more than was needed. This has resulted in weakening the price structure throughout the industry and profit margins have been exceedingly narrow. It is expected that heavy volume and narrow profits will continue throughout 1930.

If there is a slight falling off in volume during the first quarter of 1930, in sympathy with general business recession, it is felt that increased volume during the remainder of the year will bring the total volume to the 1929 level. Planned expenditures for advertising constitutes one of the best indices of sales volume in certain branches of the paper industry. A recent survey of proposed expenditures, undertaken by the Association of National Advertisers, shows a total for 1930 of $206,000,000 as compared with $186,000,000 for 1929. This increase not only indicates sustained business volume but it is as well indicative of the optimism with which business leaders view the future.

News Print Industry Hurt by Expansion

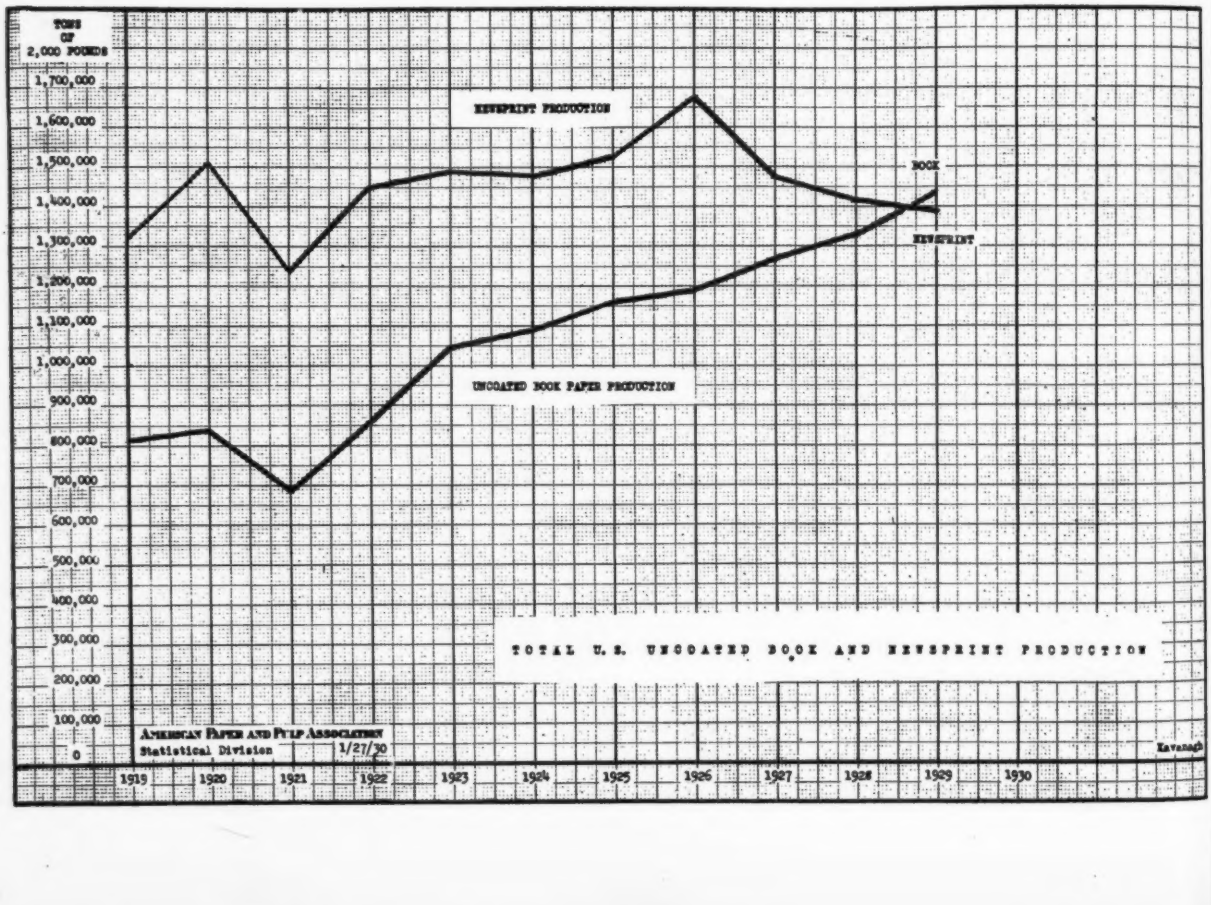
Competition, due to over-expansion, kept news print prices so low during 1929 that the business was largely unremunerative. The wave of expansion which began around 1929, however, is gradually declining and the industry has not the large over-hanging potential tonnage that it had at the beginning of last year. If consumption continues to expand at the rate it has shown during the year just closed, there may be a turn for the better before long.

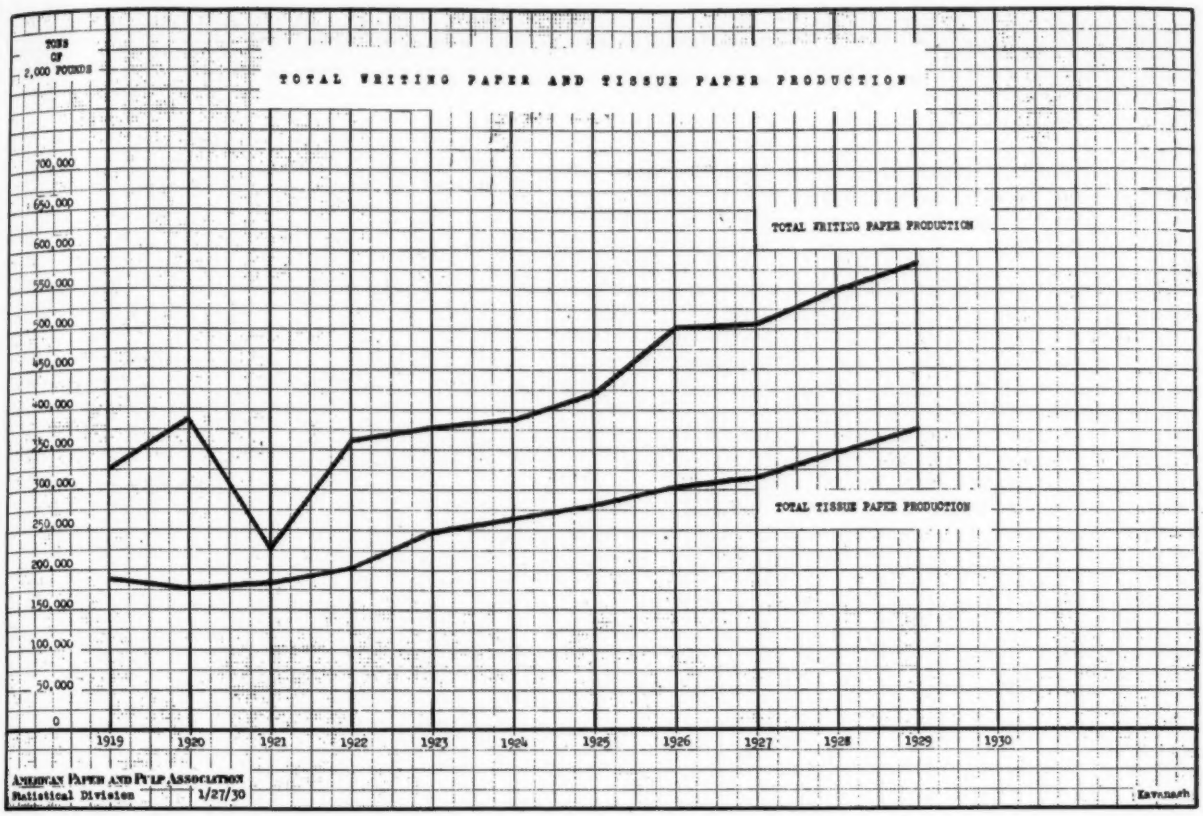
Production and distribution of news print paper reached record volumes during 1929 in North America, the total output approximating 4,400,000 tons. Domestic consumption in the United States and Canada combined was about 4,000,000 tons. Shipments during the year totalled slightly more than production and stocks in the hands of the manufacturers at the end of the year were 10,000 tons less than at the beginning, which shows that the industry is in a strong statistical position.

The news print industry of North America began 1930 with an average daily capacity of approximately 17,300 tons, of which Canada has 11,100 tons, the United States 5,300 tons, and Newfoundland 900 tons. New operations scheduled for the current year are three in number, viz., two machines for the Canadian International Paper Company, at Dalhousie, N. B., which are already in operation; two for the MacLaren Company, Buckingham, Que., during the latter half of the year; and two for the Maine Seaboard Company, at Bucksport, Maine, at the end of 1930.

Fine Paper Market Was Moderately Active

Demand for practically all the standard grades of fine paper was higher than usual in the first quarter o the past year.





Conditions during the summer months were better than average and, together with the accumulation of orders from the Spring, the manufacturers were enabled to maintain a high rate of production during the usually dull months. There was a short spurt in business in the early Fall, which was followed by a severe decline, due to the falling off in business generally.

Five new machines were added to the book paper industry during the past year, with a daily capacity of 245 tons. Two additional machines with a daily capacity of 135 tons are on order for 1930. Only one new machine was installed in the writing paper industry, with a capacity of 75 tons of sulphite bond daily. Present capacity for writing paper industry is estimated at 692,000 tons and production at 585,000 tons. The capacity for cover paper is estimated at 33,000 tons and production at 28,500 tons.

The building of new machines in the tissue paper industry was the largest on record in 1929. Ten new machines with a capacity of 156 tons daily were installed. Four of the machines are for making condenser paper and one for making light weight specialties. Four large toilet paper machines were also installed, with daily capacity of 120 tons, and one machine for making paper towels with daily capacity of 15 tons.

Book Paper Output Increases Slightly

Conditions in the book paper industry during 1929 were practically identical with conditions in the two preceding years. The estimated productive capacity of mills manufacturing book paper and other grades classified as book paper, including tablet, envelope, cheap writing, etc., was 1,725,000 tons while the actual output was approximately 1,440,000 tons, which would be about 83 per cent of total capacity. Three new machines were installed during the year, with a productive capacity of 110 tons daily.

Due to production throughout the year exceeding demand, the price situation was somewhat weaker and competition for desirable orders was exceptionally keen. It is estimated that paper produced during the past year was sold on an average of $3 per ton below the price for 1928. Some spot orders are said to have been sold at even lower prices.

Prospects for 1930 are uncertain, especially as several new machines will probably be installed that will increase production by from 150 to 200 tons. Should there be a falling off in the demand for this grade of paper, due to a slowdown in general business conditions on account of the financial situation, prices may decline even further. However, should the business situation improve to any extent the outlook for book paper will be much brighter.

Over-Production in Kraft Paper Industry

While the output of sulphite grades of coarse paper was in conformity with the orders placed, there was an increase in the production of kraft paper during the past year which exceeded its demand by approximately 10 per cent. The production of kraft paper averaged 74 per cent of its capacity and stocks in the hands of the mills increased nearly 20 per cent. Due mainly to this condition, the price situation in the kraft paper market was unsatisfactory.

On the other hand, it is all the more worthy of note that prices of the sulphite grades of coarse paper have suffered less from fluctuations than any other class of paper. Wise individual production control of the sulphite paper manufacturers played a major part in this result. Incidentally, stocks in hand of sulphite wrapping paper at the end of the year were fully 10 per cent less than at the beginning of 1929.

From the best figures available, it will be seen that the consumption of coarse papers during the past year experienced a normal increase, in common with general business throughout the country. Purchasing for immediate requirements is a policy that has been established by purchasers, both merchants and converters, and will probably be in effect as long as the capacity to produce exceeds current needs.

Record Box Board Output Produces Little Profit

Despite the fact that the volume of production in the paper board industry was greater than ever before, prices drifted constantly lower in face of an increased demand, and little profit was made by the manufacturers. In the autumn the peak season was cut short by the break in the stock market, which was followed by cancellations of orders, rapid curtailment of production, and piling up of raw material inventories.

While figures for 1929 are as yet incomplete, there is an indicated increase of production of 332,000 tons. It is estimated that 45 per cent of this increased tonnage is due to greater operating activity. The average activity during 1929 shows about 79 per cent or 4.7 days. More efficient operating methods resulting in a greater tonnage per hour are accountable for 38 per cent of the increase and the remaining 17 per cent is attributed to the new machines added to the industry.

A gradual decline in box board prices was in progress at the opening of 1929 and with the exception of the months of April and May continued until the close of the year. Shrewd buyers had temporary advantages in dealing with mills anxious for volume, but each successive period saw a new low registered. With the price decline came substitutions to cheapen the product and all the subterfuges which accompany loss of reasonable profit in industry. The industry is in need of the greatest co-operation at this time and the efforts of the Paper Board Industries Association to stabilize conditions should have the unanimous support of each member.

Chemical Pulp Demand Was Fairly Consistent

The feature of the Chemical pulp market during the past year was the continued strength of unbleached sulphite, both strong and easy bleaching. Almost all the established brands of strong unbleached were in great demand from the beginning of the year until October, when the volume of business declined slightly. Grades selling at about $51 per short ton, on dock, Atlantic ports, in January, advanced to about $58 in October. Grades of easy bleaching sulphite on which the market price was about $54 at the beginning of the year reached the unusually high level of $63 per short ton, on dock, Atlantic ports, before the weakening of the market in October.

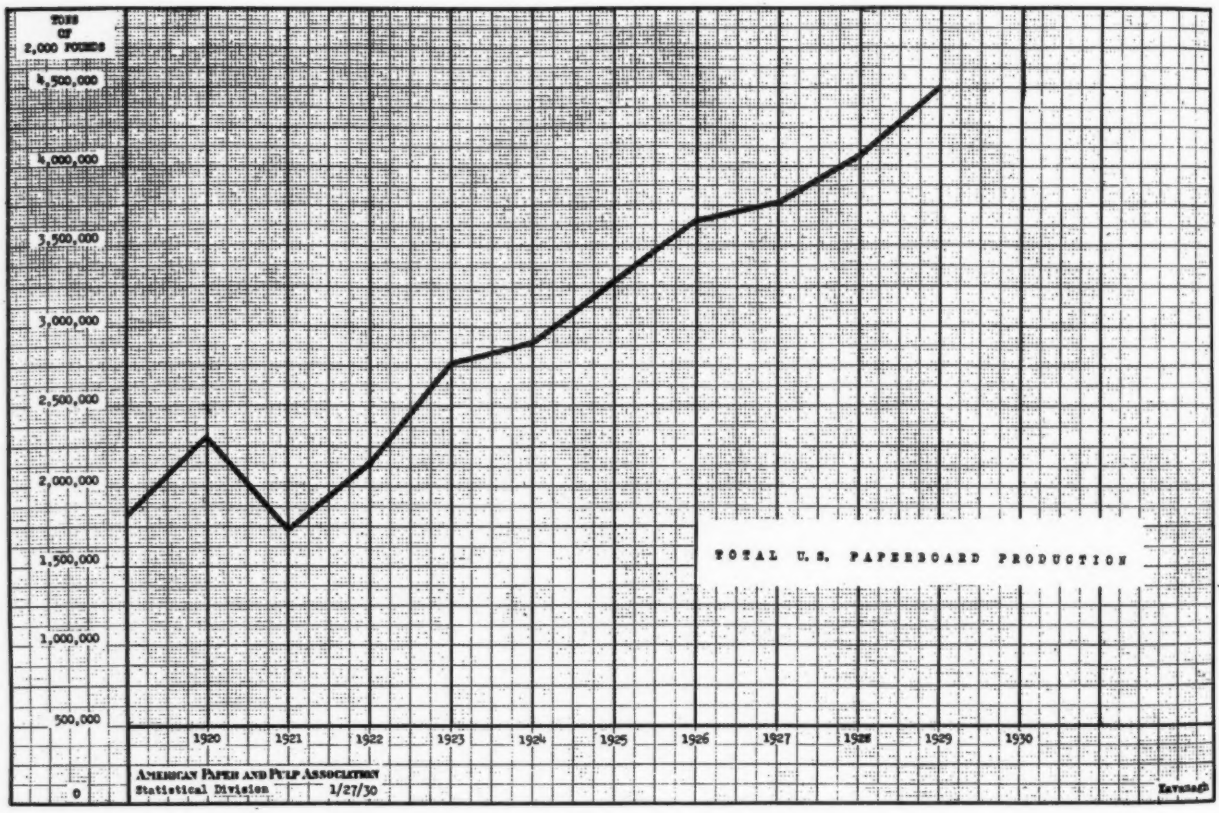
Bleached sulphite pulp was not as active as unbleached, although the turnover was satisfactory, due to the large consumption of this product by the artificial silk industry. Prices declined somewhat, and imported brands selling at prices ranging from $72 to $85 per short ton, on dock, Atlantic ports, in January, were quoted at from about $67 to $85 at the end of the year, while domestic grades were offered at as low as $72, f.o.b., cars, buyers' mills.

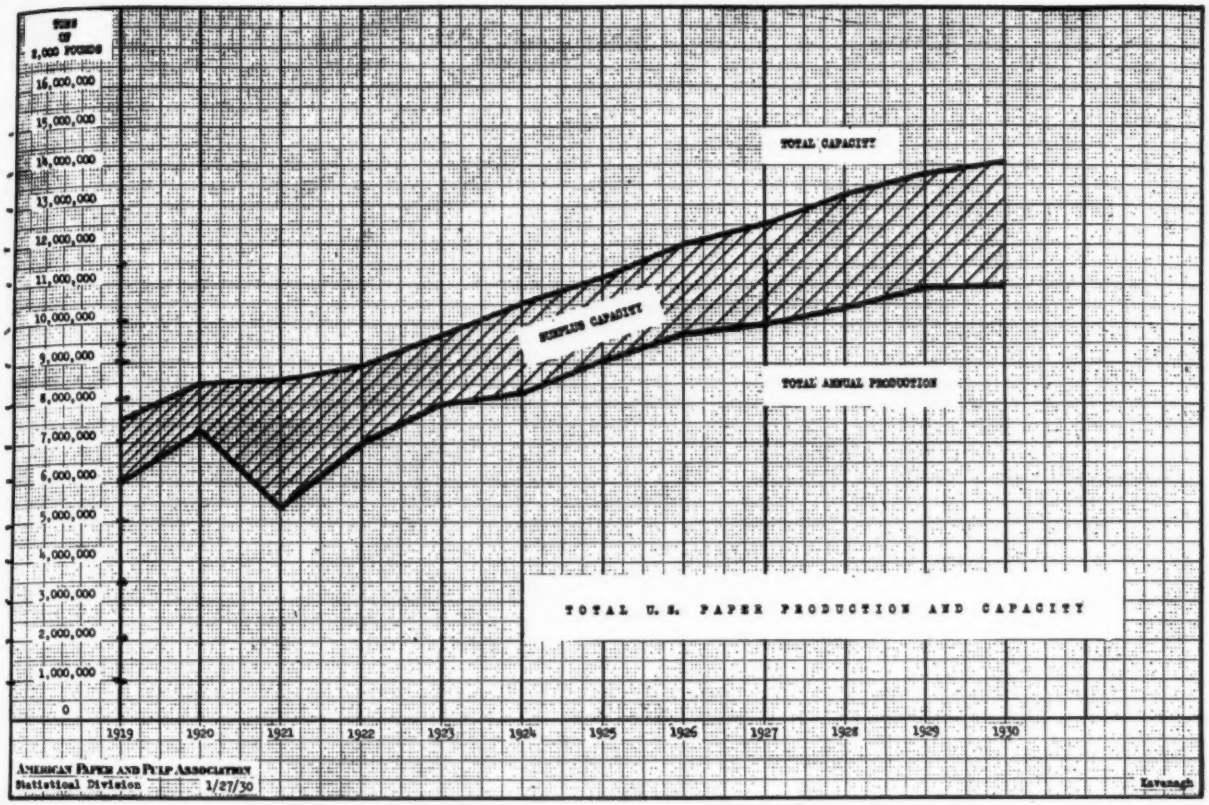
The volume of kraft or sulphate pulp purchased for deliveries, both for 1929 and 1930, was fairly satisfactory, but the American and Canadian mills, as well as those abroad in a position to make shipments the year around, were frequently favored. There was an increased importation from Sweden, due to the improved quality of several brands of kraft pulp, which previously had not been deemed suitable for the better grades of kraft paper.

Demand for mechanical wood pulp was fairly persistent throughout the year, with the usual price fluctuations in accordance with water conditions at the grinders. Prices per ton, f.o.b., the pulp mills, ranged from $26 to $32 during the first nine months of the year and from $34 to $36 on spot business during the last quarter.

Paper Stock Conditions Unsettled

Conditions in the waste paper trade were worse in 1929 than since 1921 and the market was very unsettled throughout the year. Due to the unsatisfactory position of the board mills, the lower grades were only in slight request and prices were ex-





tremely weak. The better grades of paper stock, however, were fairly steady especially books and shavings.

The domestic rag market was irregular. All grades of cotton cuttings were firm during the first quarter, but towards the end of the year they reached the lowest levels for some years past. Rag content papers were in improved request, due to the campaign of the Writing Paper Manufacturers, and sulphite papers were also in persistent demand. Old rags did not fluctuate much, but were not particularly active. Roofing rags remained fairly firm throughout the year.

Old rope showed great improvement over the preceding year. Domestic and imported manila rope were in heavy request and prices on the various grades were much firmer. The demand for strings fell off slightly. Consumption of bagging was fairly satisfactory during 1929. Quotations were well maintained, at steady levels.

Paper Making Chemicals Were in Heavy Demand

The constantly increasing quantity of chemical products used in the paper and pulp industry was one of the factors responsible for record breaking production of chemicals. Demand kept pace with consumption during the greater part of the year, resulting in a considerable increase in the volume of business as compared with the corresponding period of the preceding year. Towards the end of the year, however, the demand became somewhat less active and prices declined, in some instances.

Along with banking and many other lines of business, the chemical industry of late has apparently contracted the merger habit. A number of important consolidations were reported in the chemical industrial field during the past year. These combinations should tend to stabilize market conditions and adjust production to consumption in many lines, an end which would prove welcome to both seller and purchaser.

The outlook for the current year is decidedly promising and another year of growth and development is predicted for the chemical industry. Although consumers had been careful in their buying during the last quarter of 1929, a noticeable improvement in business occurred in January, which is an excellent augury for the future.

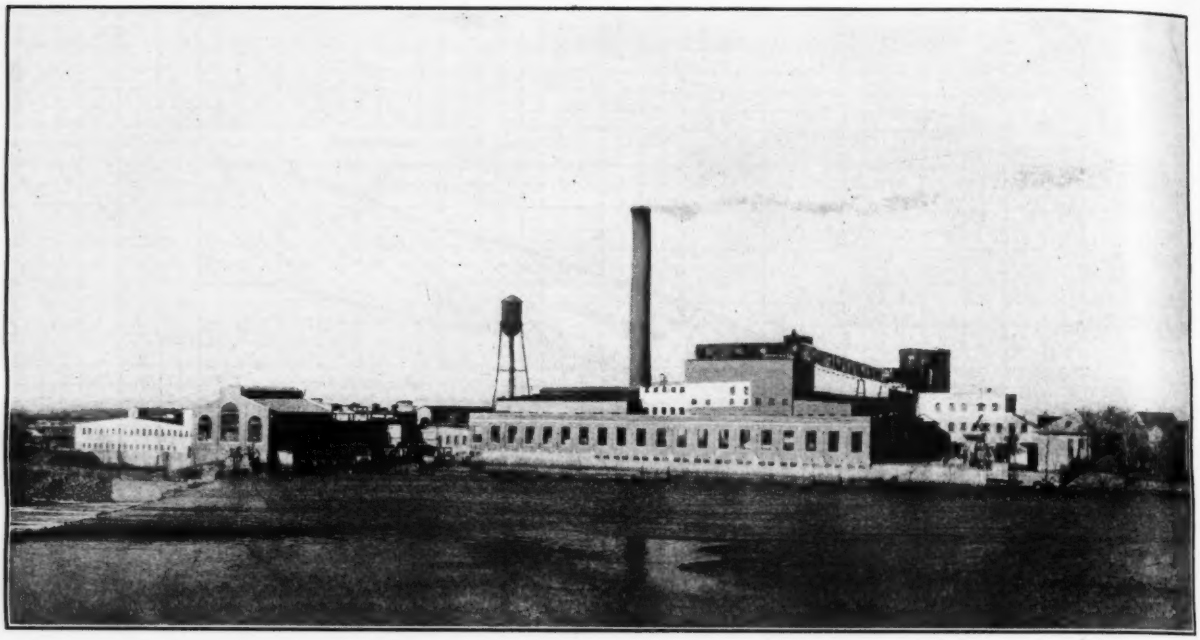
NEW FORESTRY BUILDING AT SYRACUSE

The announcement by Governor Roosevelt of an appropriation amounting to $600,000 for a new building to be added to the New York State College of Forestry at Syracuse University is the result of efforts exerted by the late Dean Moon and the Board of Trustees during the past three or four years.

It is a bit of irony that this announcement should come three months after the death of the Dean. This much needed addition was one of his ambitious dreams that a Science Building should be erected to relieve the congestion that has been a handicap many years through the lack of room in the present building for laboratories and adequate class rooms.

Students applying for admission to the Forestry College have been turned away regularly year after year primarily due to the lack of facilities and the lack of a large enough teaching staff. Acting Dean Nelson C. Brown is hopeful that the new building and further appropriations will surmount these obstacles and make for the fulfillment of the destiny of forest education in the State of New York.

Last year tentative plans of the new building were drawn by Professor Laurie D. Cox, head of landscape engineering, and were discussed by the faculty under the direction of Dean Moon. These plans were sent to the State Architect and while the original provisions will probably be altered, the general idea will stand practically as Dean Moon, Professor Cox and the faculty originally intended. The structure will be located near the southwest corner of the present college building and will face the stadium.



NEW KRAFT MILL OF THE NEKOOSA-EDWARDS PAPER CO.

The 1928-1929 Building Program of the Company Included the Construction and Erection of a New Sulphate Mill Increasing the Total Kraft Tonnage to a Maximum of 180 Tons Per Day. The Illustration Shows the New Wet Machine Room Building, 311 Feet Long by 86 Feet Wide Which Will House What Is Said To Be the Most Modern Kraft Producing Machinery Known to Science Today.

Book Paper Conditions Practically Unchanged

Output of Mills Increased to Some Extent During Past Year and Production Continued to Keep Ahead of Consumption—Only Three New Machines Were Installed During 1929, With Capacity of 110 Tons Daily—Due to Over-Production Prices Declined Approximately $3.00 Per Ton—Several New Machines May Be Installed This Year, Increasing Production, Which May Cause a Further Price Weakness.

Specially Written for the Annual Review Number of the Paper Trade Journal

REVIEWING the book paper industry for 1929, the conditions that existed were almost identical with conditions that existed for the previous two years, 1927 and 1928. The productive capacity of mills manufacturing paper of this grade was increased to some extent so that the production continued to keep ahead of the consumption.

Productive Capacity Greater

In 1928 the estimated productive capacity of mills manufacturing book paper and other grades classified as book paper, such as tablet, envelope and cheap writing, etc. was 1,690,000 tons. As near as can be ascertained, there was produced during that year, 1,335,000 tons, which meant that the consumption was only about 80 percent of productive capacity. In 1929 the conditions were almost the same, but a shade better, if anything.

Estimated Output

The estimated production of the mills manufacturing book paper in 1929 was 1,725,000 tons and the nearest figures we can get on the production is 1,440,000 tons, which would be about 83 percent of the productive capacity.

In 1928 there were four new large modern book machines installed that have a production of about 185 tons a day. In 1929 there were but three new machines installed with a productive capacity of 110 tons a day.

Lower Prices Prevailed

Owing to the production throughout the year exceeding the demand, there was a tendency to lower prices and we would estimate that the paper produced during 1929 was sold on an average of $3. per ton below the average price for 1928. Some desirable spot orders that were placed during the year of 1929 were unquestionably placed at even lower prices.

Outlook for Current Year

The outlook for 1930 is not particularly bright inasmuch as there is a prospect of installing several new machines that will unquestionably increase production in the neighborhood of 150 to 200 tons over what it has been in 1929. This is naturally going to cause further weakness in the price situation, particularly since there will no doubt be a falling off in the consumption of this grade of paper, due to the slow down in business generally, which is attributed to the financial situation, due to the lowering of values of all securities and the crash in the financial market.

It is hoped that a recovery in the general business situation will come about in the near future so that the mills manufacturing book paper will be able to operate on a basis fully equal to 1929 and perhaps something better.

Year of New Records In the News Print Industry

Total Production In North America During 1929 Amounted to Nearly 4,400,000 Tons, An Increase of 348,883 Tons, Or 8.6 Per Cent Over Preceding Year—Domestic Consumption In U. S. and Canada Combined Approximated 4,000,000 Tons, An Increase of 5 Per Cent Over 1928—Advertising In Daily Newspapers Was About 4 Per Cent Greater Than In 1929—Three Mills Scheduled to Begin Operations.

By R. S. Kellogg, Secretary of the News Print Service Bureau.

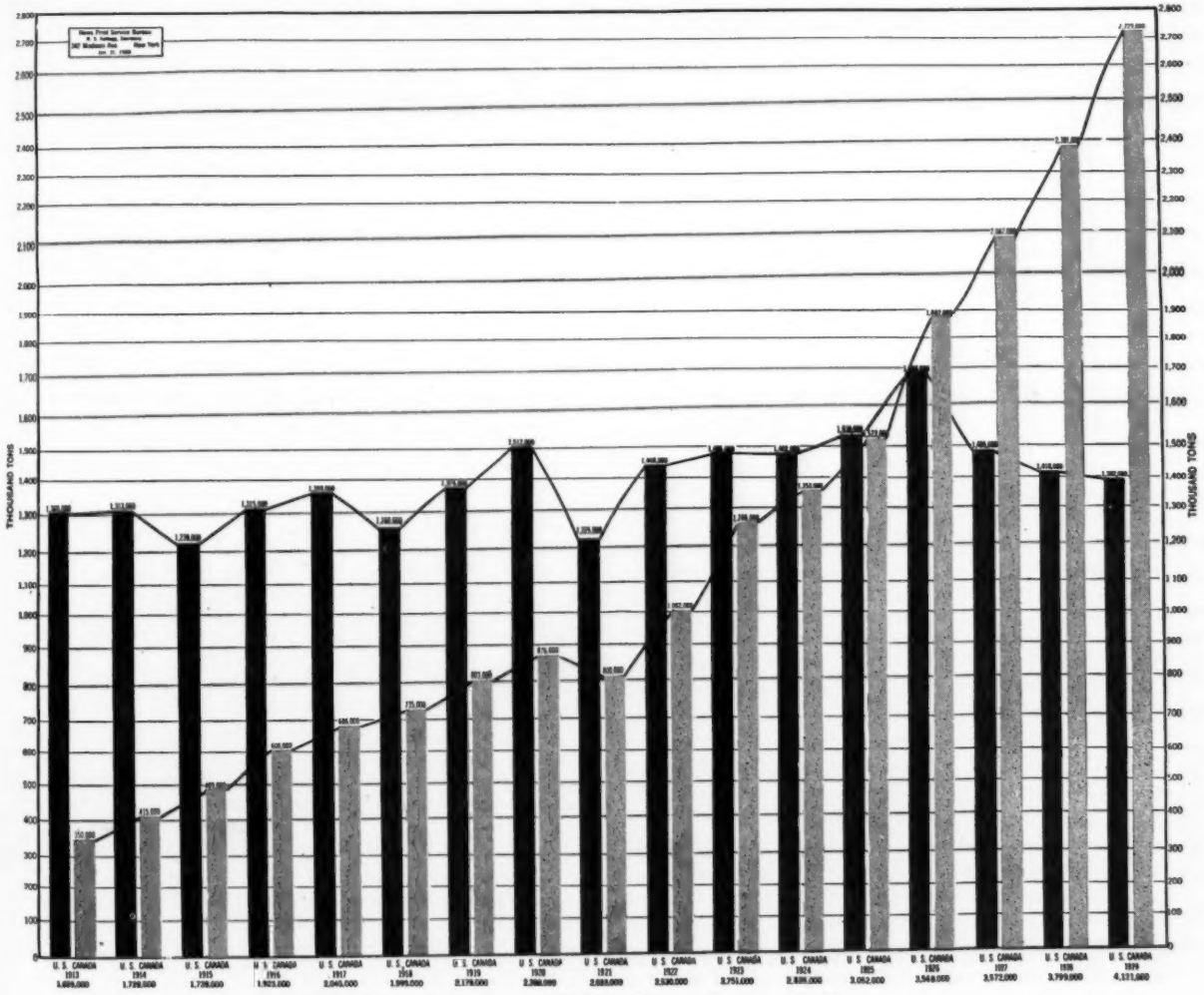
NEW records in the production and distribution of news print paper in North America were made during 1929, with a total output of nearly 4,400,000 tons. Canadian overseas exports amounted to 338,000 tons and another 100,000 tons went overseas from Newfoundland. Domestic consumption in the United States and Canada combined was approximately 4,000,000 tons.

Operation for the industry as a whole was at 84 per cent of rated capacity. New machines made ready for operation during the year had a daily capacity of 940 tons, and additional new machines expected to be ready to run before the end of 1930 will have a capacity of 720 tons more.

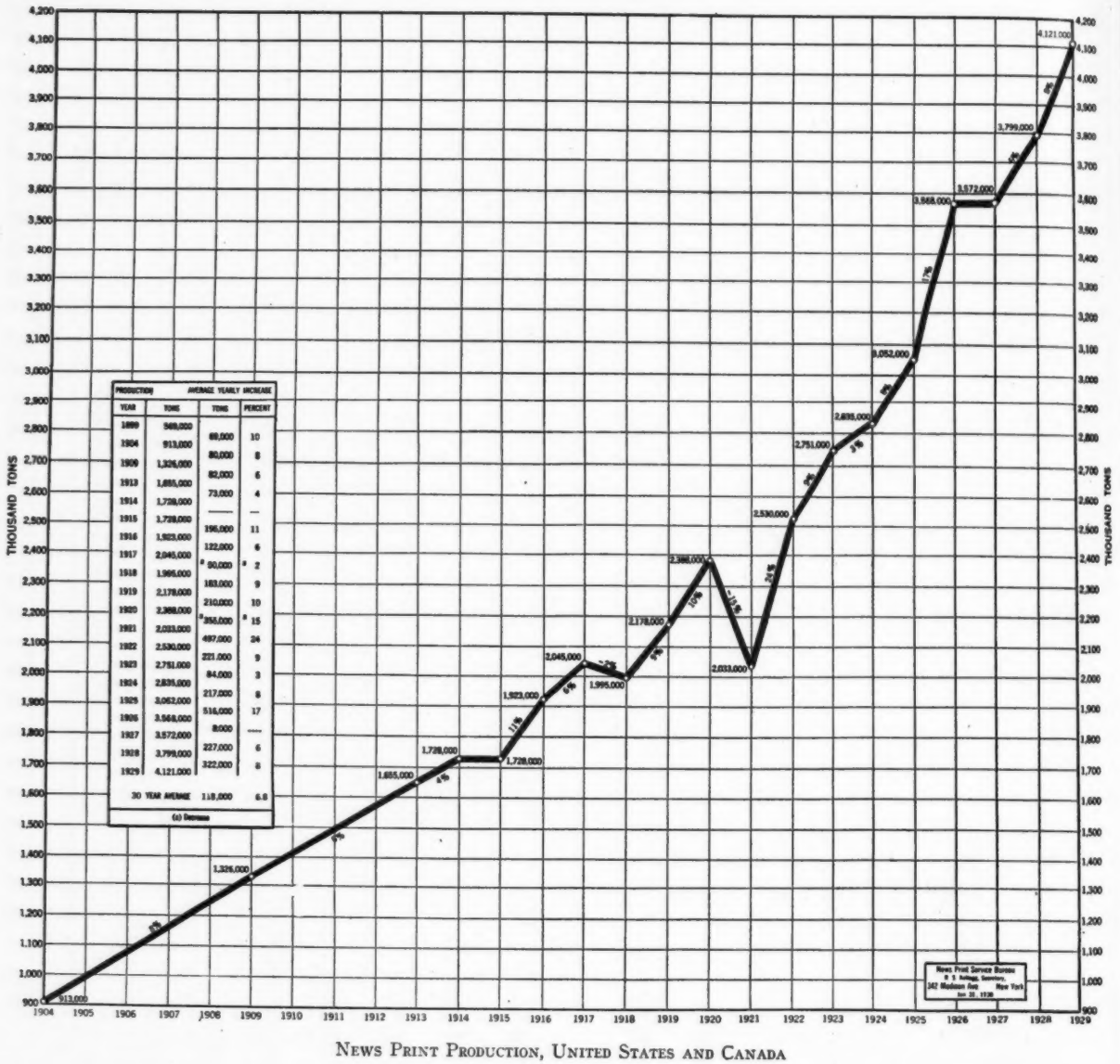
The detailed figures show in round numbers a production of 2,729,000 tons of news print in Canada last year; 1,392,000 tons in the United States; 256,000 tons in Newfoundland; and 19,000 tons in Mexico—Mexico being self-contained with respect to production and consumption. Compared with 1928, Canadian production increased 14.6 per cent, Newfoundland 10.7 per cent, Mexican, 10 per cent, while United States production decreased 1.8 per cent. Shipments during the year totaled slightly more than production and mill stocks at the end of the year were 10,000 tons less in volume than at the beginning.

Overseas Shipments Increase

Canadian overseas shipments increased 24 per cent and ship-



NEWS PRINT PRODUCTION, 1913-1929, UNITED STATES AND CANADA



NEWS PRINT PRODUCTION, UNITED STATES AND CANADA

ments to the United States 12 per cent; exports of news print from the United States, which long ago ceased to be an important factor, amounted to 19,000 tons in 1929, compared with 11,000 tons in the previous year. Imports of overseas news print into the United States, which averaged 137,000 tons yearly, 1921-28, inclusive, dropped to 96,000 tons in 1929. Stocks of white paper in the hands of the publishers were approximately 35,000 tons greater at the end of 1929 than at the beginning.

Per Capita Consumption

United States and Canada used a total of about 5 per cent more news print paper in 1929 than in 1928, bringing the per capita consumption up to new high records of 62 lbs. in the United States and 44 lbs. in Canada. These two countries combined used about 57 per cent of the world's supply of news print last year.

Newspaper Advertising Gains

Advertising in the principal daily newspapers in the United States was about 4 per cent greater in 1929 than in 1928. Reports for the six months ending September 30 showed total circulations of daily and Sunday newspapers in the United States in excess of 66,000,000 copies—an increase of 4 per cent over the same period in 1928. Daily newspapers with circulations in excess of 100,000 copies averaged 32 pages in size during 1929, compared with 30 pages in 1928, with the Sunday issues averaging 104 pages both years. This was a new record in size of dailies but below the 1926-1927 averages for Sunday issues.

Production in 1930

The North American news print industry is beginning 1930 with an average daily capacity of approximately 17,300 tons, of which in round numbers, Canada has 11,100 tons, United States 5,300 tons and Newfoundland 900 tons.

New Operations Scheduled

New operations scheduled for the year are three in number—two machines for the Canadian International Paper Company at Dalhousie, N. B., to start in February; two for the MacLaren Company, Buckingham, Quebec, during the latter half of the year; and two for the Maine Seaboard Company at Bucksport, Maine, at the end of 1930.

Coarse Paper Survey for 1929—Trend for 1930

Production Has Individually Been Regulated to Marked Degree So That Proper Relation Between Supply and Demand Has Been Maintained in Most Cases—Consumption During Past Year Registered Normal Increase—While Sulphite Grades Suffered Little From Price Fluctuations, Over-Production of Southern Kraft Was Mainly Responsible for Unsatisfactory Conditions in This Branch of Industry.

By Arthur N. Waring, Arthur N. Waring Co. Dist. Rep. Fletcher Paper Co., Port Huron Sulphite & Paper Co.

IN making a review of the past year and an estimate of the probable trend for the current year of the important industry of manufacturing and distributing coarse papers, we cannot help but feel great satisfaction with the results over the past twelve months and optimism for the future.

The above statement is made advisedly, notwithstanding the well known facts that this branch of the industry has a capacity to over produce, and that the black figures representing earnings are in many cases tinged with red.

The consumption of coarse papers during the year 1929, from the best figures obtainable, experienced a normal annual increase. The consumption of this item follows closely the curves showing the trend of other major commodities and in common with them is in line with the condition of general business throughout the country.

Purchasing for immediate requirements is a policy established by buyers, both merchants and converters, which will be in effect, so long as the capacity to produce exceeds actual current needs.

Wrapping Paper Imports

It may be of interest to note the following figures covering imported wrapping papers for the past seven years: 1923, 44,006 tons; 1924, 24,825 tons; 1925, 9,985 tons; 1926, 8,325 tons; 1927, 13,367 tons; 1928, 14,124 tons; 1929, 9,345 tons.

Managers during the past year, with but few exceptions, have recognized the fact that paper cannot be produced to the full capacity of the mills without complete demoralization of the industry. Production, therefore, has individually been regulated to a very marked degree so that the proper relation between supply and demand has in most cases been maintained.

How do the managers of these individual mills obtain information as to the trend of their particular branch of the industry which will guide them in the operation of their plants? The answer is the distribution of accurate statistics assembled by the various trade associations, most of which are or should be affiliated with the American Pulp and Paper Association.

Management has come to fully realize that it cannot blindly run full time production and satisfactorily market its output without due regard to the statistics which are available, as to production, stocks on hand, orders on file, etc., of all manufacturers making the same or similar grades.

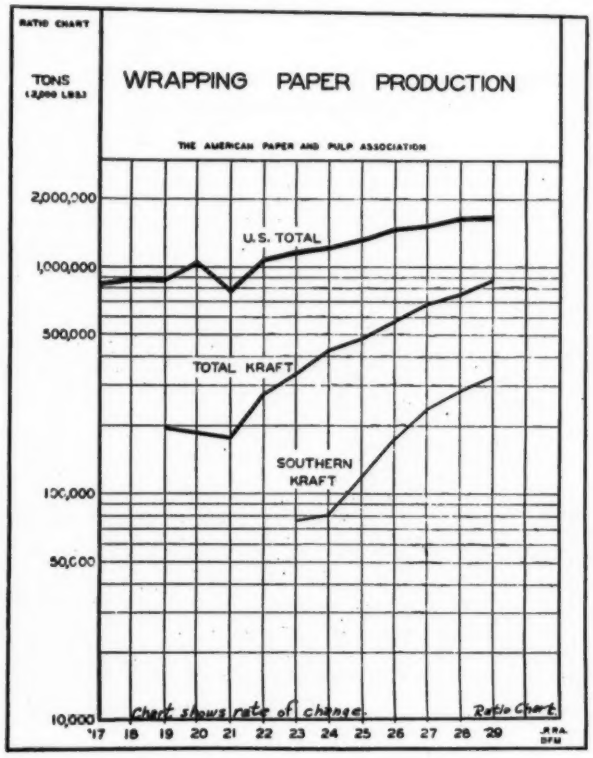
Coarse papers can be roughly divided into two general classes, viz: those made from sulphite or ground wood pulps or a combination of both, and those made from sulphate or kraft pulp.

Output During Last Five Years

A careful study should be made of the figures in Table 1 showing production with percentage of *increase* each year (except as noted) over the past five years.

The compilation in Table 1 is made partly from the figures of the Bureau of the Census, and are all supplied through the courtesy of J. A. Kavanagh, statistician of the American Pulp and Paper Association.

It is clear from the above table that the increase in the production of southern kraft is a decided factor in the reduction in the output of sulphite grades. It is, therefore, all the more worthy of note that prices of sulphite grades have suffered less from fluctuation during the past year than any other class of paper. Wise individual production control has played a major part in the above result. Hence, the optimism as to the future mentioned at the beginning of this survey.



Association's Good Work

The National Sulphite Paper Manufacturers' Association, through its educational activities, is to a great degree responsible for the stable condition of the sulphite coarse paper industry. This association has not only increased its membership which now comprises a substantial majority of the total tonnage produced of these grades, but has brought about a spirit of confidence and friendliness among its members that is invaluable to obtaining best results for all.

At the end of 1929 the stocks on hand of sulphite wrapping paper, were less by fully ten per cent than at the beginning of the year. Production at this time is running in conformity with orders placed.

The National Kraft Paper Manufacturers' Association has an active and comprehensive membership and through the

TABLE 1

	1925	1926	1927	1928	1929
Southern Kraft	120,000	175,000 (45 per cent)	242,000 (38 per cent)	286,000 (18 per cent)	325,000 (13 per cent)
Total Kraft	567,500	690,000 (21 per cent)	778,995 (12 per cent)	833,000 (6 per cent)	880,000 (5 per cent)
Sulphite and Other	724,500	730,000 (.8 per cent)	746,005 (2 per cent)	732,000* (1 per cent)	715,000* (2 per cent)
Grand Total	1,292,000	1,420,000 (9 per cent)	1,525,000 (7 per cent)	1,565,000 (2 per cent)	1,595,000 (1 per cent)

* Decrease.

intelligent and vigorous work of its manager, Oliver M. Porter, is supplying its members with statistics which are accurate and convincing and which are the only true guide to profitable operation. The members of the Kraft Association are confronted with some difficulties in relation to production control that do not, at least to as great an extent, apply to the manufacturers of sulphite papers. We have reference to the diversity in cost of production due to the decided natural advantages of some of the mills, particularly those in the southern states and on the Pacific Coast as contrasted to the mills which do not have natural advantages such as low cost raw material and labor.

Kraft Paper Situation

During 1929 the production of kraft paper averaged 74 per cent of its capacity and exceeded its demand by about 10 per cent and at the same time stocks increased nearly 20 per cent. This is not a pleasant picture, but it is a true one. The capacity to produce must be individually restrained in order to place supply and demand in proper balance, or complete disaster confronts this branch of the paper industry.

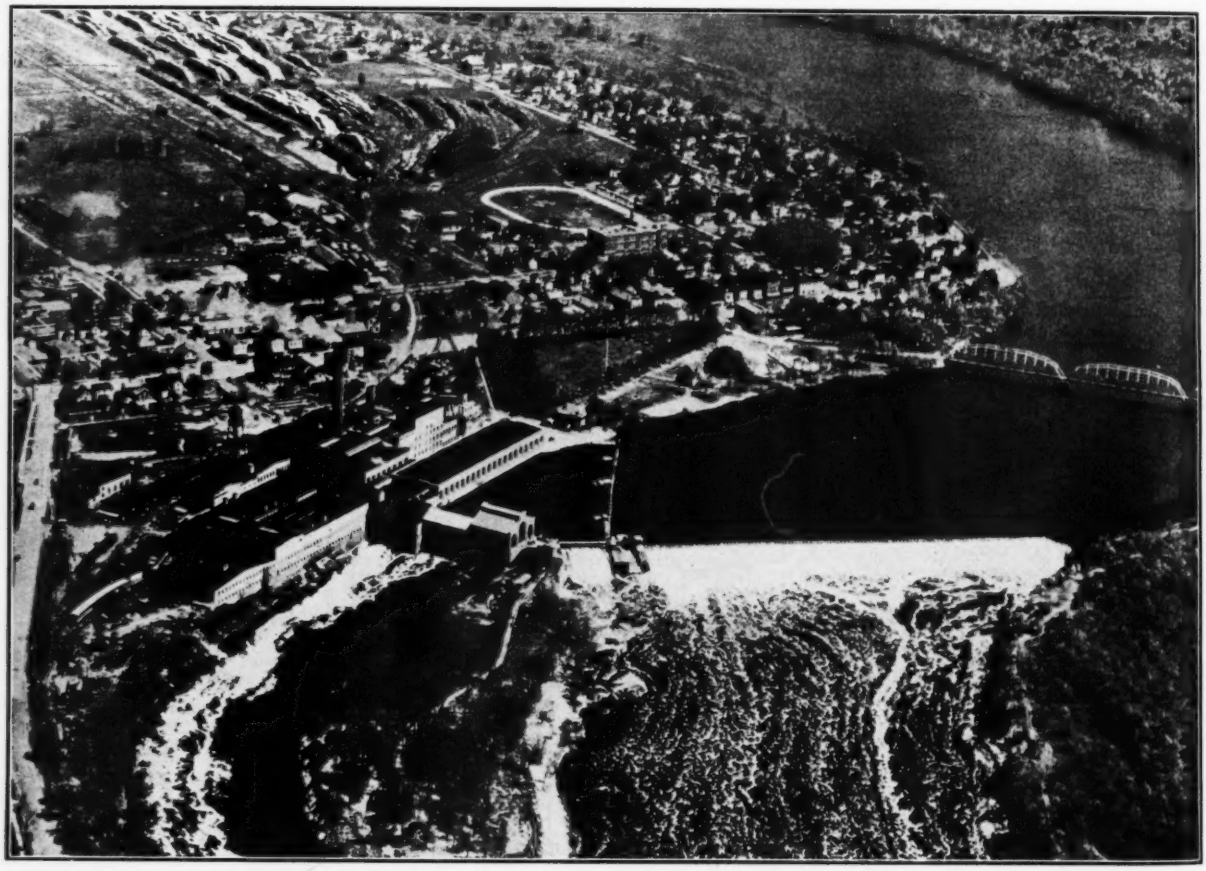
The human element as it affects the confidence of one competitor, in his fellow competitor, is a tremendous factor where over production actually exists and it is the duty of every member of a trade association to so conduct his own actions that he may not only have the goodwill of his competitors but of his customers as well.

In an industry wherein exists a capacity to produce far in excess of consuming demand, an association of all the members of that industry is a vital necessity and there is no other method under the existing laws of the country, whereby the violent and disastrous price fluctuations can be avoided. These fluctuations are, if possible, more disastrous to the buyer than to the seller.

The statistical and educational work of trade associations is playing an important part in the industry and because of the progress made there is every reason for assurance of a bright future.

MACSIMBAR INCREASES DIRECTORS

The board of directors of the MacSimBar Paper Company of Otsego, Mich., was increased two in number at the annual election by the addition of Chapin Dewing and L. H. Kirby, both of Kalamazoo. Those re-elected to the directorate are George D. Cobb, S. B. Monroe and W. E. Kidder, Kalamazoo; Florence G. Anderson, C. E. Nelson and S. W. Simpson, Otsego; Fred C. Hall, Grand Rapids; E. W. Stone, Allegan and John Vanderveen, Holland. C. E. Nelson was re-elected president, S. W. Simpson, vice president, S. B. Monroe, secretary-treasurer and George D. Cobb, assistant secretary-treasurer.



NEW AERIAL VIEW OF PROPERTIES OF THE NEKOOSA-EDWARDS PAPER CO., AT NEKOOSA, WIS.

This View Not Only Gives a Beautiful Perspective of the Wisconsin River, But Also Shows the Log Piles As Well As Some of the Buildings Comprising the Company's New Kraft Mill. At This Point Also Is Located One of Three Splendid Hydro-Electric Power Developments.

Heavy Demand for Paper Making Chemicals in 1929

Statistics Show Constantly Increasing Volume of Chemical Products Going Into Manufacture of Various Grades of Paper and Pulp—Consumption Kept Pace With Production During Greater Part of Past Year, Resulting in Considerable Increase in Volume of Business As Compared With Preceding Twelve Months—Towards End of Year Buying Became Less Active and Price Levels Declined Slightly.

By Guy A. Gardner, Manager Chemical Division, M. Gottesman & Co., Inc., New York

MARKED expansion in practically all important lines of manufacturing was the outstanding feature of the past year in the chemical industry and was particularly true of many products largely used by paper and pulp manufacturers. In fact, the tonnage produced of several major items ran into record-breaking figures and the pulp and paper industry must be given credit for no small share in this result, statistics showing constantly increasing quantity of chemical products going into the manufacture of the various kinds of pulp and paper.

During the greater part of the year the demand from the chemical consuming industries kept pace with production resulting in a considerable increase in the volume of business as compared with the figures reported for 1928. This condition continued until the last two or three months of 1929 when the buying became somewhat less active and increasing competition due to over-production, had a disturbing effect on price levels. The year as a whole, however, can safely be said to have been satisfactory in so far as a general average for the entire twelve months is concerned.

The chemical industry during the last year or two seems to have contracted the merger habit, along with banking and many other lines of business. The past year has been unusually productive of these large combinations, a number of important consolidations in the industrial chemical field being reported. These combinations will undoubtedly tend to stabilize market conditions and adjust production to consumption in many lines—an end desirable from the viewpoint of both buyer and seller.

Tariff Delay Causes Uncertainty

The new Tariff Bill is still in the making and recent developments in Congress seem to indicate that we cannot expect an early settlement of all the conflicting ideas and demands that have been put forward. The delay in this matter has produced considerable uncertainty and hesitancy in the chemical industry, particularly among the exporters and importers, although its effect has been felt to no small degree in the domestic sales. Exports, however, increased during 1929 and showed an appreciable gain over the figures for the preceding year.

While consumers have been careful in their buying during the last few months, a noticeable improvement in business occurred in January and there is every reason to believe that this improvement will continue so that by the end of 1930, another year of growth and development may be recorded by the chemical industry.

Chlorine

Over-production of chlorine with consequent lowering of price levels was in evidence towards the end of the year. Contracts for 1930 were placed at materially lower figures than the price prevailing in 1929.

Caustic Soda and Soda Ash

Increased production and consumption of caustic soda and soda ash was recorded for the year, the pulp and paper manufacturers using approximately 10 per cent more of these alkalies during 1929 than in 1928. Market prices were steady and contracts over 1930 were placed on the same basis as in 1929. The current contract price for soda ash light 58 per cent in bags is $1.32 per 100 lbs. and for caustic soda solid 76 per cent in drums is $2.90 per 100 lbs. f.o.b. works, in car lots

Sulphur

1929 was a record year for the production of sulphur. Shipments showed an increase of approximately 13 per cent over the previous year. The price held firm, quotations remaining at $18.00 per ton at the mines for the entire twelve months.

Aluminum Sulphate

During the greater part of the year the prices on sulphate of alumina, both commercial and iron free, were firm but due to competitive selling, quotations were lowered in the closing months and contract prices for 1930 were materially reduced by both eastern and western manufacturers. The last month or two, however, has seen several mergers take place, particularly in the middle west, which will no doubt result in a better market condition for the balance of the year on this important paper makers chemical.

Salt Cake

A decided scarcity of salt cake developed during the year, mainly as a result of the change in the method of manufacturing the mineral acids and also to the greatly increased demand from the sulphate pulp manufacturers. Domestic manufacturers have sold their entire production for months ahead and there has been a considerable increase in importations with the demand apparently still unsatisfied. The price of salt cake rose gradually during the year and contracts for 1930 were placed at materially higher prices. Inasmuch as every indication seems to point toward a continuing increase in consumption and a decrease in production, higher prices on salt cake may be looked for during the coming year.

ARIZONA CHEMICAL CO. FORMED

Announcement is made of the formation of the Arizona Chemical Company to take over the natural salt cake (sodium sulphate) deposits near Clarkdale, Arizona, formerly operated by the Sodium Products Corporation.

The principal product of this company will be salt cake for the paper, glass, stock feed and other industries. This production will fill the demand which has been in the past to a large extent filled by importations of salt cake from Europe. It is estimated that during 1929 approximately 100,000 tons of salt cake were imported into this country from Europe. This source has now been practically eliminated due to a change in the process of manufacture of muriatic acid, of which salt cake is a by-product. Production of salt cake in the United States has also been curtailed, due both to the change in muriatic acid process, and the fact that nitric acid is now largely manufactured from ammonia rather than from nitrate of soda.

The Arizona Chemical Company will be operated by the Kalbfleisch Corporation, with offices at 200 5th avenue, New York city. The sale of its products will be handled jointly by the Kalbfleisch Corporation and A. Klipstein & Co.

Extensive alterations and additions to the present equipment will be made, and it is expected the plant will be in operation by April 1.

Fine Paper Industry Has Fairly Prosperous Year

All Standard Grades of Fine Paper Were in Unusually Active Demand in Early Months of 1929—Summer Recession Was Less Noticeable Than Usual and Permitted Manufacturers to Maintain High Rate of Production During Usually Dull Period—Autumn Spurt in Business Was Brief and Was Followed by Severe Decline—Total Volume of Business for 1929 Was 6.5 Per Cent Higher Than in Preceding Year.

By E. H. Naylor, Sec.-Treas., Writing and Cover Paper Mfrs. Assn.

THE fine paper market in 1929 enjoyed to a moderate degree the prosperity in the general business of the country. The early months of the year were characterized by a higher than usual active demand for all grades of paper. The summer let-down was less than usual, and together with the accumulation of orders from the spring permitted the mills to maintain a high rate of production during the usually dull months of the summer. The usual fall spurt of business lasted but a short time in 1929 and was followed by a severe decline in sympathy with the falling off of general business.

The Writing paper mills, however, maintained a high level of production until December in order to replenish their stocks which had been depleted to some extent by the abnormal demands of the earlier months. As soon as the individual mills had their stocks in good shape, they began adjusting their production to demand. The total volume of buiness for 1929 was 6.5 per cent higher than in the preceding year. The sales of Cover paper were 4 per cent higher than in 1928.

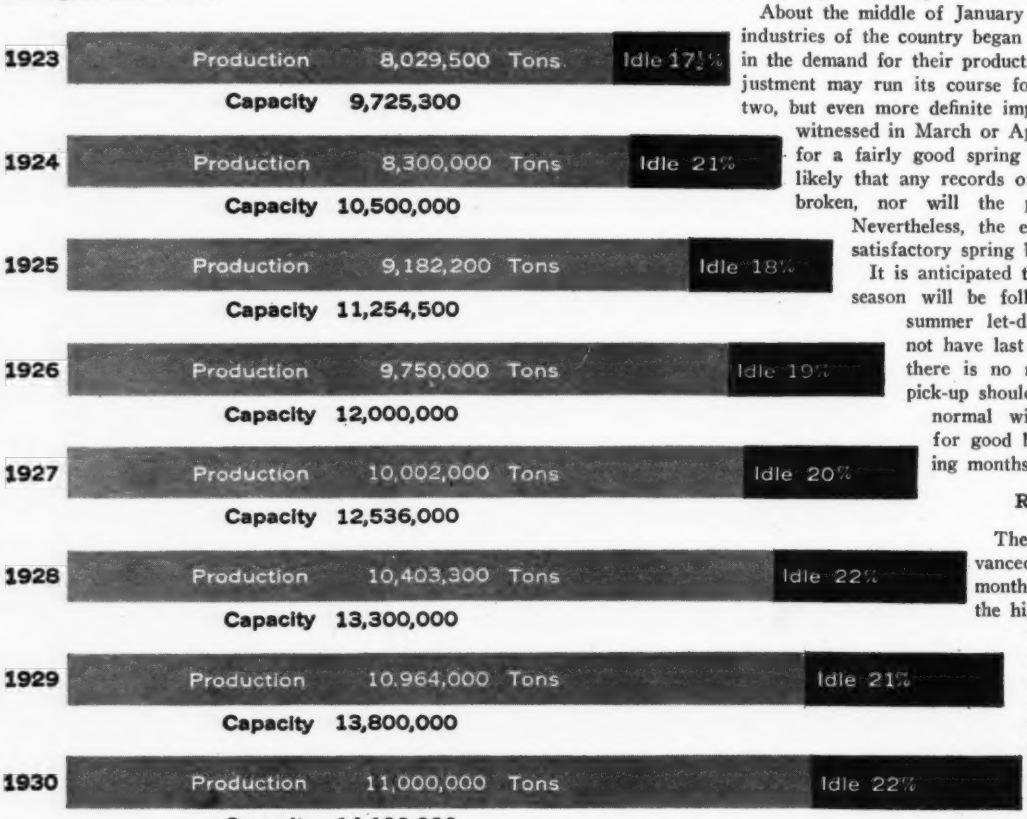
Standard mill lines and the papers which are being backed by an increasing amount of advertising and sales promotion work showed continued progress in a year that brought difficulties to other parts of the paper industry. In sulphite bond the field of non-standard papers was narrowed down by the development of several No. 2 watermarked and advertised lines. The marketing difficulties of the Writing paper industry now remain largely in the field of the lowest priced papers.

We expect that the total volume of sales for the year 1930 as a whole will be about the same as in 1929. This indicates that the recession in the first part of 1930 will eliminate the normal growth which is customary in American business from year to year.

For the fine paper industry, producing an essential commodity of everyday use, this means that we may expect a total volume of production practically equal to the record volume of 1929.

Readjustment in general business is still the order of the day, but there is unmistakable evidence of improvement. The low mark for the fine paper industry was witnessed in December. About the middle of January most of the leading industries of the country began to feel improvement in the demand for their products. The business adjustment may run its course for another month or two, but even more definite improvement should be witnessed in March or April. The outlook is for a fairly good spring business. It is not likely that any records of production will be broken, nor will the profits be brilliant. Nevertheless, the expectation is for a satisfactory spring business.

It is anticipated that an active spring season will be followed by the usual summer let-down, which we did not have last year, but after that there is no reason why the fall pick-up should not be fully up to normal with every indication for good business in the closing months of the year.



CAPACITY AND ACTUAL PRODUCTION OF PAPER MACHINES IN U. S. A.

Raw Materials

The price of rags advanced sharply in the early months of the year due to the high rate of consumption of rags in the production of rag content papers. Conditions settled down in the summer and late in the fall, prices began to recede but have not yet returned to the 1928 level.

Cotton

The 1929 cotton crop was 14,919,000 bales which is 4 per cent higher than a year ago. Ordinarily this crop would have been insufficient for domestic and foreign consumption. In addition, we had the smallest carry-over in years. These conditions would usually make for high cotton prices but the severely depressed conditions in the domestic as well as foreign cotton business has so reduced the consumption of cotton that supplies are more than ample and the price has been sinking. The activities of the Farm Board may develop some stability for cotton.

Pulp

In the pulp market the outstanding features of 1929 were the steady increase in the price for unbleached sulphite as against a steadily declining price for bleached sulphite. Increased production of bleached sulphite on the Pacific Coast, in Canada and in Europe created a surplus which depressed the market even before the recession in business. In unbleached sulphite there was very little increase in productive facilities anywhere in the world, and Scandanavian producers were able to sell their output months ahead.

Labor

Labor costs showed very little change in 1929, but showed no signs of decline. Wage rates in fine paper mills are 137 per cent above the pre-war level.

New Machines

Reports received from paper-making machinery manufacturers indicate that 27 new machines with a daily capacity of 1,381 tons were installed in the United States in 1929. These machines represent an increase in capacity for the industry as a whole of 428,000 tons. In addition to this, there were numerous increases to capacity by improvements and betterments in existing machines and improvements in operating speed. The increase in capacity in 1929, therefore, may be conservatively estimated at about 500,000 tons.

Total production for the industry showed a further large gain as it did in 1928. With the estimated production at 10,964,000 tons and capacity at 13,800,000 tons, operations were equal to 79 per cent of capacity as compared with 78 per cent in 1928.

For 1930 there are already on order eleven new machines with a daily capacity of 785 tons. This will bring the capacity for 1930 up to at least 14,100,000 tons. This figure will probably be exceeded if new paper-making machines continue to be added to the industry at the rapid rate they have been brought into production in recent years.

With the expected lull in business in the first half of this year there is little basis for expecting an increase in this year's paper production. The total output for the year will do well to equal the record production of 1929. On this basis, operations will be at the rate of 78 per cent of capacity.

As has been said, in all leading grades of paper, there is a large over-capacity, but some branches of the industry are in a better situation than others. Idle capacity of 15 per cent as compared with one of 20 per cent does not seem large when one considers that there is a difference of only 5, but in reality the percentage difference in the degree of over-capacity between one and the other is over 30 per cent.

Estimated Capacity and Production

The following indicates the estimated capacity and production for the various grades for 1929:

	1929 Estimates of Capacity	Production	Per Cent Idle Capacity
News Print	1,750,000	1,370,000	22
Book	1,780,000	1,440,000	19
Writing and Cover	725,000	613,500	15
Wrapping	2,200,000	1,641,000	25
Board	5,425,000	4,500,000	17
Tissue	470,000	375,000	20
Building	850,000	498,000	41
All Other	600,000	526,500	12
Total	13,800,000	10,964,000	21

Writing Paper

In the Writing paper field only one new machine with a daily capacity of 75 tons of sulphite bond per day was installed in 1929.

The capacity in 1930 for the Writing paper industry is estimated at 692,000 tons and the production at 585,000 tons, the same as in 1928.

In Cover paper, capacity is variable because of other grades made on the same machine. For 1930 the figures are estimated: capacity, 33,000 tons; production, 28,500 tons; 14 per cent idle.

Book Paper

During 1929 five new machines with a daily capacity of 245 tons were added to the industry. Two additional machines with a daily capacity of 135 tons are on order for 1930.

Tissue Paper

In the Tissue paper branch of the industry, the building of new machines in 1929 was the largest on record. Ten new machines with a daily capacity of 156 tons were installed. Four of these machines are for condenser paper and one for making various light weight specialties. The combined capacity of these five machines is only 12 to 20 tons per day, depending upon the grade made.

Inaddition, four large toilet paper machines were installed, having a daily capacity of 120 tons, and one machine for making towel papers having a daily capacity of 15 tons.

Three additional machines with a daily capacity of 85 tons are planned for installation on the Pacific Coast in 1930.

News Print

The shifting of news print production from the United States to Canadian mills continues.

	Total North America Tons	U. S. Tons	U. S. is Per Cent of Total
1914	1,788,000	1,313,000	73
1919	2,238,000	1,324,000	59
1923	2,827,000	1,485,000	53
1926	3,766,000	1,684,000	45
1927	3,789,000	1,485,000	39
1928	4,046,000	1,417,600	35
1929	4,395,000	1,392,000	32

Machines that can no longer be profitably employed on news print in the United States are constantly seeking new grades.

Wrapping and Board

The largest addition to capacity in 1929 as well as in 1928 was in the Wrapping paper industry. During 1929 eight new machines with a total daily capacity of 630 tons were installed. Six of these machines with a daily capacity of 565 tons are for kraft paper. The other two machines are for wrapping specialties. Two additional kraft machines are on order for 1930.

In the Board industry only three new machines with a daily capacity of 275 tons were installed last year, which was a substantial reduction from the very large and burdensome additions of previous years.

CHAMPION TO ELECTRIFY MACHINES

The Champion Coated Paper Company of Hamilton, Ohio, will electrify ten of its paper machine drives, having placed with the Westinghouse Electric and Manufacturing Company an order for ten single motor paper machine drives, each complete with automatic control and a carbon pile automatic speed regulator, to replace the steam drives now in use.

Each drive includes one 220 hp., type SK, d-c. motor; a 175 kw. motor generator set consisting of a synchronous motor, a d-c. generator, and an exciter; and control equipment including a control panel for the synchronous motor, a speed regulator panel, and a d-c. control panel.

Installation of the equipment will be begun about March 1 when the first drive will be installed. The other drives will be installed subsequently at intervals of two weeks between the installation of each drive.

Paper Board Industry Has Unprofitable Year

While Production Was Maintained in Greater Volume Than Ever Before, Prices Declined Constantly Lower in Spite of Increased Demand in All Branches—Indicated Output of Box Board Mills Was Approximately 332,000 Tons in 1929, of Which 45 Per Cent Was Due to Greater Operating Activity—Great Over-Production Capacity Exists and Paper Board Industry Is in Need of Closest Co-operation.

By Grafton Whiting, Statistician of Paper Board Industries Association.

THERE are three reasons why the year 1929 stands out as remarkable: the volume output was greater than ever before; the periods of activity failed to follow the usual custom; and prices drifted constantly lower in face of an increased demand. All branches of the box board industry had similar experiences, varying in extent, but each resulting in the realization that long hours of hard work had produced but little profit for some, and for many an actual loss.

"Box board," as the term implies, is a paper mill product designated for use in the fabrication of corrugated or solid fiber shipping containers, folding or collapsible boxes, and set-up or rigid boxes. Collectively, these constitute the box board industry. As each of the branches has had to meet conditions peculiar to itself, the review which follows will treat of the branches separately.

Box Board Mills

A mill is classified as a box board producer when its output is made of wood or similar fibers matted together on a paper machine to form a board 12 points, (12/1000 of an inch), or more in thickness. Such board may be made entirely of new wood fiber pulp; from waste paper stock reworked into pulp; or from a combination of the two. Coloring matter may be introduced, various methods of finishing employed and even a waterproofing process added to render the board impervious to ordinary dampness.

During 1928 there were 3,368,100 tons of board made by box board mills, and while figures for 1929 are as yet incomplete, there is an indicated increase of 332,000 tons. It is estimated that 45 per cent of this increased tonnage is due to greater operating activity. The average activity during 1928 was 76.8 per cent or 4.6 operating days per week, whereas 1929 shows about 79 per cent or 4.7 days. More efficient operating methods resulting in a greater tonnage per hour are accountable for 38 per cent of the increase, and the remaining 17 per cent is attributed to the new machines added to the industry.

The box board industry has two periods of strong demand. These occur in March and September, the latter period usually the greater. Chart No. 1—the first section—illustrates the periods of activity and is drawn with a solid line representing the normal or anticipated activity and a broken line setting forth the performance for 1929. It will be noted that the broken line stands well above the solid line during the first half of the year and distinctly below for the last half. This was typical of any other industries; but in box board the anticipation of even greater volume in the Fall led to errors in business policy and resulted in the sharp curtailment indicated in the exceptionally low level for December.

The machines used in box board mills vary in construction and capacity. One of the chief differences is found in the machine width which determines how wide a sheet can be successfully run. In expressing statistically the machine activity, recognition is given to this variant and the term "inch hours" is used, i.e., the width or trim of the machine multiplied by the hours operated. Under a program of 6 days a week, 24 hours a day, there would be 144 hours a week, and by multiplying the full time hours by the inch trim of the machines, the total rated inch hours is obtained. This rating is given a value of 100 per cent. Each week the actual hours operated by the mills so reporting is multiplied by the machine trim, and the sum total divided by the rated inch hours gives the per cent of running time. For the purpose of the chart, the weekly figures are consolidated by months. Chart No. 2 illustrates the running time for the past three years, and comparison of the activity in the same months during the three periods will indicate the difficulty experienced in 1929 in forecasting production by predicating the trend on previous performance.

By a review of past performance the rated capacity in tons for each mill is established. By dividing the figure into the tons manufactured and likewise into the tons of orders booked, two series of percentages are found depicting the relationship between demand and supply. By superimposing the figures on the same

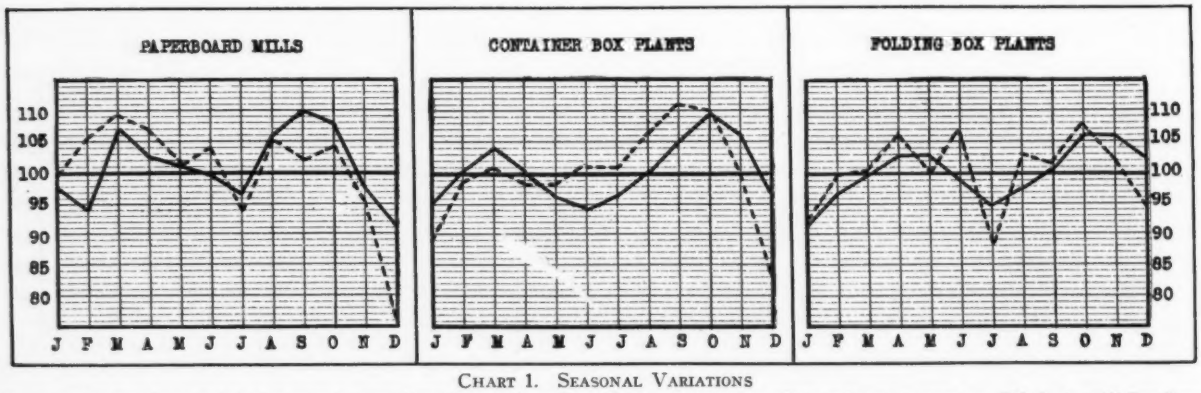


CHART 1. SEASONAL VARIATIONS

The operating time for a period of 5 years is consolidated by months and expressed as a percentage above or below the average. This is the solid line drawn on the chart. The actual running time for 1929 is treated in like manner and is shown by a broken line. It will be noted that the mills experienced greater activity in the first half year with a corresponding loss in the last half. Container plants showed the reverse and folding box plants followed, although irregularly, the normal season trends.

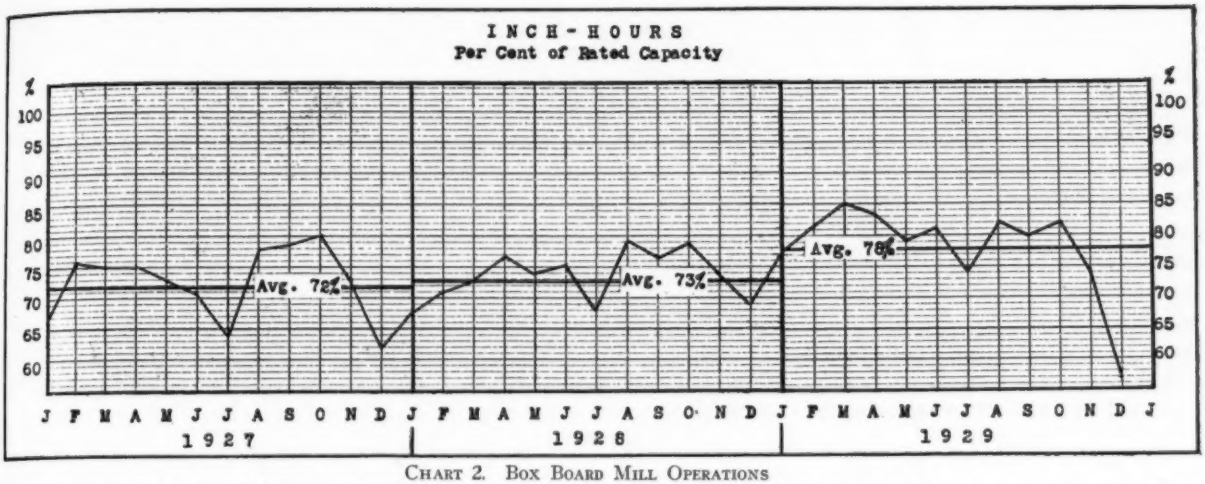


CHART 2. BOX BOARD MILL OPERATIONS

The rated capacity in inch hours is found by multiplying the trim width of the machine by 144 hours to give the total inch hours per week here consolidated by months. This figure is divided into the actual inch hours run and the result stated as a percentage. The percentages and yearly averages are here plotted for the past three years.

chart, the situation can be shown graphically. Such a display is chart No. 3. Where orders run in excess of production, a white area is made, and for the converse, a black area is filled in. During 1927 and 1928 these areas are about evenly balanced, whereas in 1929 the black area predominates almost throughout the year. Such an unbalanced condition could have but one result —a marked decrease in unfilled orders. At the beginning of 1929 there were enough orders on hand to require 9.4 days of capacity operation to complete them. At the close of the year but 5.4 days work remained.

Gain or Loss

To judge the contrast between orders and production by noting the white and black areas is apt to be misleading. To bring out the condition more clearly a bar chart is drawn (Chart No. 4) with the periods of gain in orders over production shown rising above the base line in proportion to the extent of the gain (here termed "points") and periods of loss below.

It is evident that beginning early and continuing throughout the year unusual competitive conditions existed. These may be summarized briefly as follows:

General demoralization of prices for all grades of coarse paper and boards, and in particular for products fabricated from box boards.

Strong effort made to increase volume of output and thereby reduce costs to meet the low market prices.

Increase in plant capacity due to greater efficiency as reflected in larger tonnage output per hour.

The added capacity of new machines and of kraft wrapping and bag paper machines converted to box board production.

In the fall of the year the peak season was cut short by the break in the stock market which was followed by cancellations of orders, rapid curtailment of production and piling up of raw material inventories.

Of the conditions noted above, the continued conversion of the kraft mills into producers of box board—kraft liners—was perhaps the most serious.

Kraft Liners

In 1926 to 1927 a new type of box board called "Kraft Liner" began to appear. In its original form it was made entirely of sulphate or kraft pulp, resulting in a very strong and tough board. It was used for the manufacture of shipping containers replacing the "Jute Liner" for certain types of boxes. It soon developed that by replacing a portion of the sulphate pulp with cheaper materials, the board could be made at a price to meet competition with other types of liners. At first such board was made on a cylinder machine and later a Fourdrinier kraft liner was developed.

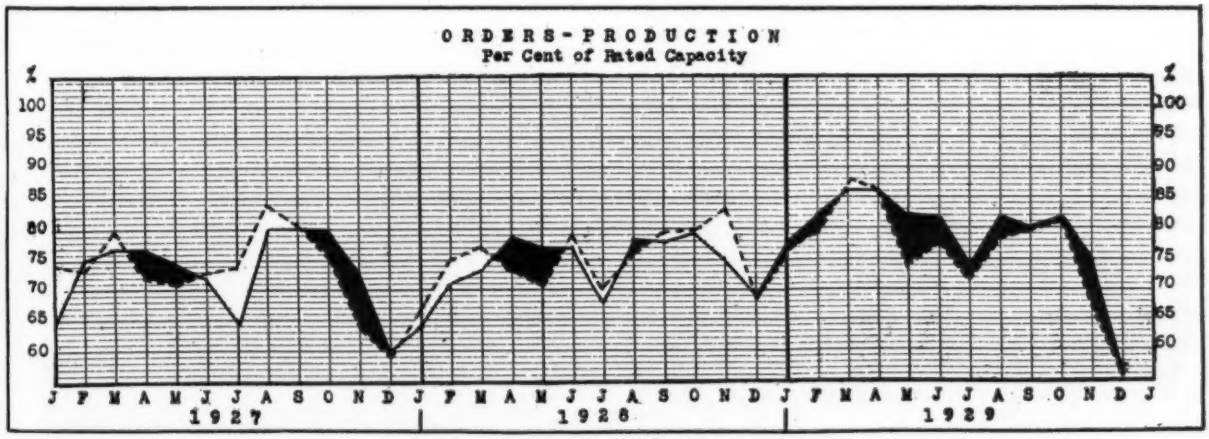


CHART 3. BOX BOARD MILL OPERATION

Rated capacity is the average production per hour multiplied by 144 hours to give the total rating for a week. The orders booked are divided by the rated capacity and expressed in a percentage. In like manner the production is figured as a percentage and both are here consolidated by months. The black areas indicate production in excess of orders and the white areas the reverse. It will be seen that production exceeded incoming orders throughout the year, constantly reducing the back log of unfilled orders on hand.

The introduction of these brought a large potential capacity into the box board industry. In 1927 about 77,000 tons of kraft liner was made; in 1928, 165,000 tons; and for 1929 the estimated total is over 275,000 tons. The addition of this tonnage to the industry already burdened with a capacity far in excess of demand has brought the price levels to the lowest point experienced in many years.

Prices

At the opening of 1929 a gradual decline in box board prices was in progress and, with the exception of the months of April and May, continued until the close of the year. Shrewd buyers had temporary advantages in dealing with mills anxious for volume, but each successive period saw a new low. With the price decline came substitutions to cheapen the product, and all the subterfuges which accompany loss of reasonable profit in business. It is becoming more and more evident that a *debased* and unstable raw material price engenders a constantly weakening market for fabricated products, endangering the whole industry and depriving one after another of a just return upon his investment.

Containers

Shipping containers made of fiberboard are of two types—corrugated and solid fiber. The first is constructed of two outer members called "liners" pasted firmly on either side of a corrugated or fluted liner with one or more layers of chip board ironing the middle portion. These are pasted together flat and become a strong laminated board. Boxes are made from the two types of board by cutting sheets into the desired size, creasing and slotting them and joining the edges together.

During 1928 1,133,000 tons of corrugated boxes were made and 684,000 tons of solid fiber. For 1929 the estimated totals are 1,292,000 tons corrugated and 716,000 solid fiber, being a growth of 12½ per cent and 5 per cent respectively. In corrugated, the increase resulted for the most part from longer hours of operation which averaged 47.9 hours per week in 1928 and 52.3 hours in 1929. The output per hour due to machinery improvement and greater productivity per man hour, amounted to 5.2 per cent. In solid fiber fewer hours per week were run as shown by the average of 47.3 hours in 1928 and but 46.5 in 1929. Offsetting this, the output per hour increased over 5.5 per cent.

Operating Ratio

There are two general buying periods each year due to seasonal activities. One is in the spring when purchases are made for the shipment of spring and summer commodities, and the other in the fall when the winter and holiday season is approaching. Many industries are governed in this production by these periods and prepare their goods for the seasonal demand. Calls upon the box makers must precede these shipments; and in turn the mills must anticipate the box makers' requirements. This is the origin of the seasonal trends now firmly established in the box board industry and plotted graphically in Chart No. 1. As noted above, the mills' periods of activity are in March and September. The periods for containers are similar, but tend to lag a little behind the mill—a condition more pronounced in the fall than in the spring. The second section of the chart illustrates the container branch by a solid line and those for 1929 by a broken line. The early months of the year were somewhat disappointing for containers, although very active for the mills. The summer and fall months, however, show containers well above the anticipated running time, and had November and December held to previous averages, a new record for all time would have been established.

Per Cent of Normal Running Time

The corrugating and pasting machines are the key operations in producing containers; and by recording the hours run for each such machine, a gauge of the plant's activity is obtained in an expression comparable between the large and the small operators. It is customary to run a container plant on a single shift basis (approximately 50 hours per week). By multiplying the normal payroll week by the number of key machines, the rated machine hours are established. This figure is given a value of 100 per cent and each week the actual machine hours as reported are contrasted with this rating to give the per cent of activity. Chart No. 5 displays the weekly activity consolidated by months for both the corrugated plants (broken line) and solid fiber plants (solid line) for the past three years. The chart affords a direct comparison of the running time of one year with another, but is not indicative of the volume of out-put, since production per hour has steadily increased.

Prices

The relationship of container prices and the box board market has always been close, since 65 to 75 per cent of the box cost is found in the raw materials used. During 1929 a sharp drop in the average selling price occurred due in part to the fall in box board levels already mentioned, and in part to the keen competition among box makers. In 1928 the total sales are estimated at $100,000,000 for corrugated alone and in 1929 the total will be close to this same figure. In the face of a 12½ per cent volume increase the total sales value remains practically unchanged. The decrease in the price level was over $10.00 a ton and had the 1929 tonnage been sold at the 1928 price average, more than $12,000,000 would have been saved to the industry.

Folding Boxes

A folding box or carton is made of box board cut to proper size, creased, pasted along one edge and shipped flat to the customer. Such cartons are extensively used for food products and for

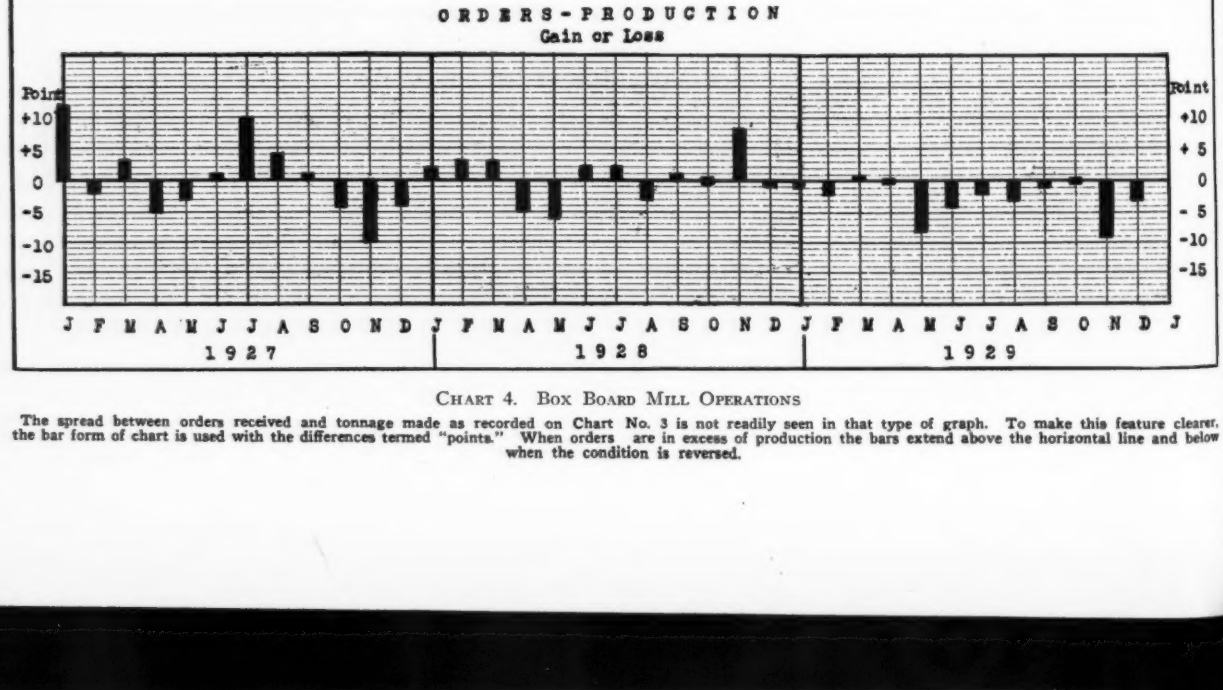


CHART 4. BOX BOARD MILL OPERATIONS

The spread between orders received and tonnage made as recorded on Chart No. 3 is not readily seen in that type of graph. To make this feature clearer, the bar form of chart is used with the differences termed "points." When orders are in excess of production the bars extend above the horizontal line and below when the condition is reversed.

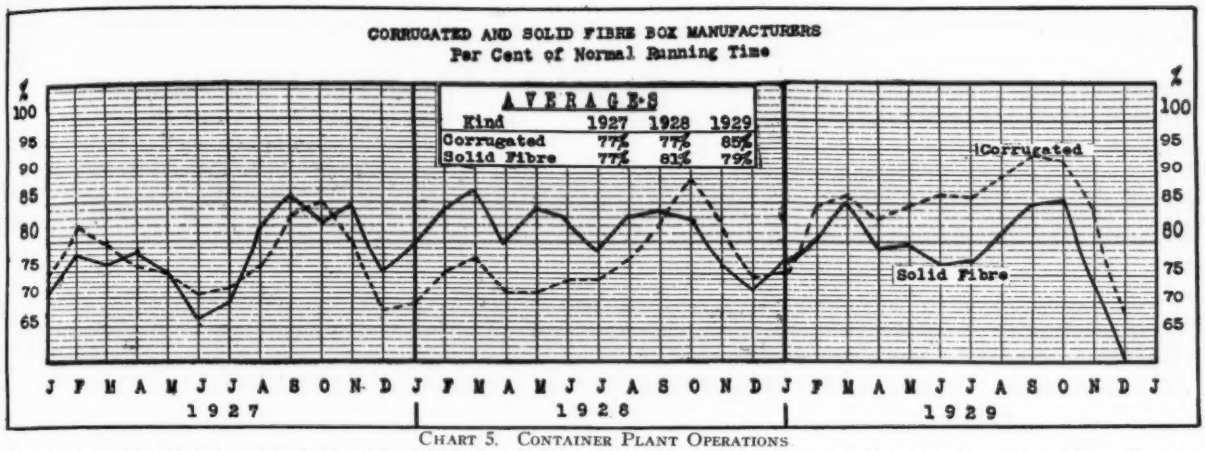


CHART 5. CONTAINER PLANT OPERATIONS

The normal or usual hours of operation per week are multiplied by the number of machines (corrugators or pasters) to give the actual possible machine hours. This rated figure is divided into the actual hours operated and gives the per cent of activity.

holding small commodities of all kinds. The folding carton is distinguished from the set-up box by the fact that it is collapsible and shipped in flat bundles. This permits a wide field of distribution at reasonable freight rates as opposed to the local character of the set-up box maker whose product is too bulky for long transportation.

Folding box output in 1928 amounted to 885,000 tons and the estimated total for 1929 is 970,000 tons. This growth was procured by increase in the running time from an average of 45 hours per week in 1928 to 47 hours in 1929. There was also a gain in production per hour of approximately 5 per cent.

Operating Ratio

The seasonal trends found in the other two branches of the industry are in evidence in the relative running time for folding box as shown by months in Chart 1, the third section. It will be seen that folding box followed the mill performance, with greater activity in the first half of 1929 (the broken line) than usually anticipated (the solid line); and although a good start was made in the third quarter, the break in the last months reduced the average.

Prices

The price level has been decidedly irregular throughout the year. The large contracts for cartons have been fought for in severe competition and taken at low prices. The development of new packages and some work of high quality have commanded better prices. As a whole this branch of the industry has suffered less than the mill or container branches.

Outlook for 1930

With the increase in the number of machines equipped to make box board and the steadily mounting average tons per hour, little prospect can be seen for the demand to approach nearer to the possible supply. If production could be regulated by demand as is done in many other industries, some semblance of stability would result. Effort is being made in this direction, but the practical application of the principle to this industry is largely a matter of conjecture. Profitable operation of box plants is dependent on a stabilized raw material market, the prospect of which is not now in sight. It has been said that the industry has been in such a debased condition and for so long a time that the only turn possible is upward. With many companies losing money or barely breaking even it is improbable that the wave of price depression can continue much longer. The industry is assured of an increasing volume as its past history will attest. There remains to be added the determination on the part of its members to sell only at a profit.

The Paperboard Industries Association

The Paperboard Industries Association has played an important part in the box board industry during 1929 and its place in the coming year will be even more prominent since it offers the only means for joint action in ridding the industry of existing bad practices, for stimulating an increased national demand, for insisting upon sound cost accounting and estimating procedure, and establishing business policies based on prompt and reliable statistical data. The association has been in existence for many years and is composed of the progressive manufacturers both large and small engaged in producing box board, containers and folding boxes. Its activities are briefly as follows:

Traffic

A department of traffic is maintained to represent the industry in its relations with the railroads and other public carriers. It is called into consultation by the Railroad Classification Board in matters dealing with the acceptance of packages in Interstate Commerce.

Laboratories

A fully equipped laboratory is operated in which scientific tests are made of members' products, and where new designs are created for the safe packaging of articles susceptible to damage in transit.

Sales Promotion

Trained research engineers are employed to develop new fields for the use of corrugated, solid fiber and folding boxes. Already thousands of tons of boxes have been added to the yearly demand from industries not previously users of fiber shipping containers and folding boxes.

Statistics and Accounting

Weekly, monthly and yearly statistics are gathered by the association and summarized currently for its members. At the same time these are forwarded to the Government for publication in the Survey of Current Business.

A uniform plan of cost accounting and estimating has been developed for each branch of the industry and men trained in this work assist members in establishing the plan and operating it in their own plants.

Conclusion

The paper board industry at this time is in need of the closest co-operation. Not alone because of the fact that a great over production capacity exists, but also because unethical practices have sprung up causing distrust of one competitor for another. In an industry where sales territories are wide spread it is important that each section know accurately the conditions existing in the other sections. A trade association is the common meeting ground for discussion of policies and the clearing up of misundertandings, often the result of misinformation. Each member of an industry owes to that industry some part of his time and effort and also his financial aid in bettering its conditions.

Chemical and Mechanical Pulp Markets were Steady

All Established Brands of Unbleached Sulphite Pulp, Both Strong and Easy Bleaching, Were in Excellent Demand From Beginning of Year—Prices Increased Materially, Until Weakening of Market in October, When Decreased Demand Caused Decline—While Less Active Than Unbleached, Turnover of Bleached Sulphite Pulp Was Satisfactory—Mechanical Wood Pulp Was in Fairly Good Request in 1929

By O. F. Swanson, Sales Manager, J. Andersen & Co., and the Pulp & Paper Trading Co.

WHEN totalling the estimated annual combined and enormous tonnage of chemical and mechanical wood pulp, manufactured exclusively from practically one kind of wood, it is not to be wondered at that efforts are constantly made to find substitutes for wood from which fibers similar to wood pulp can be made. The most promising accomplishment in this direction is probably the fiber recently manufactured from corn stalks of which there appears to be an abundant supply. Several attempts in actual paper making with pulp produced from this raw material resulted in a feeling of optimism in certain quarters as to its future possibilities. This pulp has sufficient strength and whiteness to be successfully used in a variety of papers, but before it can ever replace wood pulp entirely, or to any appreciable degree, it must be fully as clean, economical and satisfactory for the finished product.

In other words, even though its initial cost might not be higher than wood pulp, the final cost upon its complete preparation in the paper mills would govern its usage. With the rapidly diminishing pulpwood supply in certain territories and the reported increasing quantity of corn stalks, it is only reasonable to assume that continued efforts will be made to overcome any possible obstacles that may exist in connection with the manufacture of pulp from same so as to eventually produce a fiber entirely satisfactory for paper making.

Unbleached Sulphite in Great Demand

The consensus during the last quarter of 1928 by acknowledged authority leaned strongly towards a banner year in the wood pulp industry during 1929 and in a way this assumption was both right and wrong. Certain grades of pulp enjoyed very desirable business both as to tonnage, deliveries and prices, but other grades did not fare quite so well. Almost all established brands of unbleached sulphite, both strong and easy bleaching, were in great demand almost from the very begining of the year. Grades selling at about $51.00 per short ton on dock, Atlantic ports, in January gradually advanced to about $58.00 in October.

Several mills manufacturing such grades were reported practically outsold by May for shipment during 1929 which condition together with sales of a large percentage of their estimated production for 1930 placed them in a very strong position. As a matter of fact, during the latter part of the first half of 1929, there were persistent rumors of an anticipated scarcity of the so-called unbleached Mitscherlich grades for forward deliveries, but before the end of the year, it was discovered that these rumors were somewhat exaggerated.

Easy bleaching sulphites were practically in the same enviable position and several brands of this type of pulp on which the market price was about $54.00 at the first of the year reached the unusual high level of $63.00 per short ton, on dock, the same ports, before the weakening of the market in October. From then on and until the end of the year the decreased demand caused the prices to decline by several dollars per ton.

Bleached Sulphite Consumption

Bleached sulphite did not enjoy the same activity nor did it occupy a very strong position at any time during the whole year but the turnover was quite satisfactory, due in a large measure to the consumption of this commodity by the artificial silk industry amounting to a comparatively large tonnage of both domestic and foreign brands. Prices, however, did not advance as in the case of unbleached sulphite but declined instead, so that imported brands selling at prices ranging from $72.00 to $85.00 per short ton, on dock, Atlantic ports, in January, were quoted at about $67.00 to $85.00 at the end of the year, and domestic grades as low as $72.00 f.o.b., cars, buyers' mills, indicating the keenest competition prevailed in the lower grades.

Kraft or Sulphate Pulp

Kraft or sulphate pulp had a rather rough and rugged road to travel, but in spite of this, the volume of business for deliveries, both for 1929 and 1930, was not altogether unsatisfactory to any mills, but the American and Canadian mills as well as those abroad in a position to make shipments the year round were frequently favored. The less favorably situated mills, compelled to confine deliveries to the open water season of the Baltic, did neither receive the prices or tonnage for shipment during 1930 that were given the mills effecting monthly shipments throughout the year.

According to the trend of the trade, the question of deliveries was more preponderant than in the past and will in the future become a very important, if not the deciding factor in the culmination of large orders, everything else being equal. At least this situation is apt to prevail until the slack has been taken up caused by the increased production of kraft pulp abroad and the tremendous increase in tonnage of domestic paper and board made exclusively from pulp manufactured of low priced wood in mills attached to, owned and operated by, the paper and board mills. In January the prices on imported prime kraft pulp were from two to three dollars per ton higher than at the close of the year, when good grades were offered from $46.00 to $49.00 per short ton, on dock, Atlantic ports, and domestic grades depending on the quality all the way from $50.00 to $77.50 f.o.b., cars, buyers' mills.

The main reason for the increased importation from Sweden was the improved quality of several brands of kraft pulp, which previously were not found suitable for the better grades of kraft paper, the installation of improved equipment in paper mills and the increased efficiency and skill in the treatment of the fiber by the paper makers.

Progress Made in South and Far West

Owing to the great progress made by Southern and Pacific Coast mills during 1929, not only in production but in quality of their various products as well, the competition in certain lines of board and paper was so keen that some of the so called converting mills were compelled to discontinue the manufacture of certain grades of their products for which they previously required kraft pulp. The exceedingly rapid growth of the pulp and paper industry in the South during the past eight years becomes very evident when reviewing *Lockwood's Directory of the Paper and Allied Trades,* from which we learn that the

Southern mills have a yearly capacity of approximately 1,000,000 tons of pulp if based on an operating year of 300 days.

Outside of the mills now in operation there are others either in the course of construction or being planned to be built, all of which must be accepted as definite assurance as to the determination of the Sunny South to make herself the leader in products manufactured from kraft pulp, and why not, she has the most important raw material for this commodity—wood, and plenty of it, at lower prices than any other territory except possibly the Pacific Coast. Other factors in connection with the manufacture of kraft pulp are approximately the same as in any other locality, but they are of minor importance when compared with the cost of wood per ton of pulp, and as this cost is probably less than half of Northern mills, the South should have a very bright future in the kraft industry for many years to come. The position of the Pacific Coast mills is quite similar as far as the cost of producing pulp is concerned but probably somewhat more attractive for the manufacture of bleached and unbleached sulphite.

Quality of Pacific Coast Pulp Improves

The so called Pacific Coast bleached sulphite pulp was not only equal in quality last year to several well established grades manufactured elsewhere, but superior in strength and is found very suitable for several grades of paper and board. Judging from shipments I have recently inspected the quality has been greatly improved during the last three years, and a very fine sheet of bond paper is now made from same. This was considered very improbable a few years ago.

Coast Pulp Already Well Established

Should improvements in the quality of this pulp continue at the same rate as during the last three years, it will soon be on the level with the best Eastern and foreign brands. In any event the Pacific Coast's chemical pulp is already well established in several markets and in my opinion it is a matter of time only when it will be used extensively on account of increased production, comparatively attractive prices, and further improvements in quality.

Ground Wood Pulp in Good Request

Mechanical wood pulp was in fairly good demand throughout the year with the usual price fluctuations in accordance with water conditions at the grinders. Prices per ton f.o.b., the pulp mills ranging from $26.00 to $32.00 during the first nine months of the year and about $34.00 to $36.00 on spot business during the last quarter of the year.

Big Swedish Pulp Mill Merger

Among other important events in the pulp industry last year, the amalgamation of certain large Swedish pulp mills, under the capable supervision of the Kreuger and Toll interest, was the most noteworthy occurrence, and caused considerable comment regarding its probable effect on the pulp business in general and the kraft pulp industry in particular. The conservatives in the trade were agreed that no radical changes would take place but that certain improvements consistent with sound business judgment would be effected.

Pulp Industry Not Affected by Stock Market Crash

In addition to consolidations, real, unreal or contemplated, another subject widely discussed and quite extensively engaged in throughout the entire year was the stock market business and frequently regarding stocks of which the interested party had little or no knowledge whatsoever. Owing to this wave of speculative infection, a small percentage of the population suffered financial losses at the finis, but the blow also killed the bug responsible for the commotion. By so doing it cured the victims and in most cases made them immune against similar attacks in the future. Luckily the percentage of the seriously affected was so insignificant that the casualties following the crash in November did not seem to make much of a dent, if any, on the pulp and allied industries or for that matter on any other important industry. Based on my own observation both before and after the excitement in the stock market, 1930 is like the athlete, a very fine specimen indeed, trained down to weight, stripped for action, ready to go and determined to win.

BOX BOARD PRODUCTION IN JANUARY

December production of box board, based on reports to the Department of Commerce by 97 firms operating 124 plants (reports for earlier months including five concerns now out of business) was 80.4 per cent of capacity, as compared with 80.4 per cent in November and 71.4 per cent in December, 1928. In the following table the capacity data vary according to the normal number of working days in each month:

Year and Month	Operation			Production			New Orders	Unfilled Orders (end of month)
	Inch hours		Per cent of Capacity	Short Tons		Per cent of Capacity	Short Tons	
	Capacity	Operated		Capacity	Output			
1928								
Jan.	10,372,900	7,833,458	75.5	273,125	203,882	74.6	204,128	80,417
Feb.	10,372,900	8,136,737	78.4	273,125	211,862	77.6	215,333	85,862
March	11,312,244	8,843,542	78.2	297,108	227,344	76.5	244,871	93,380
April	10,474,300	8,311,710	79.4	275,100	221,079	80.4	211,304	84,513
May	10,893,272	8,733,965	80.2	286,104	242,394	84.7	224,366	73,157
June	10,893,272	8,199,515	75.3	286,104	228,646	79.9	228,252	77,782
July	10,474,300	7,992,170	76.3	275,100	201,153	73.1	209,976	79,492
Aug.	11,312,244	9,236,068	81.6	297,108	230,750	77.7	236,682	81,816
Sept.	10,055,328	8,344,464	83.0	264,096	224,971	85.2	234,449	87,097
Oct.	11,384,820	9,430,136	82.8	299,052	244,894	81.9	241,491	81,022
Nov.	10,541,500	8,843,466	83.9	287,976	240,124	83.4	248,447	93,203
Dec.	10,541,500	7,631,500	72.4	287,976	205,546	71.4	198,648	94,174
Total (year)	128,628,580	101,536,731	78.9	3,401,974	2,682,645	78.9	2,697,947	.....
1929								
Jan.	11,417,328	9,297,029	81.4	307,268	248,290	80.8	241,086	87,974
Feb.	10,539,072	9,435,967	80.0	283,632	228,034	80.4	227,595	87,726
March	11,417,328	9,416,990	82.5	307,268	256,118	83.4	266,895	96,209
April *	11,417,328	9,278,701	81.3	307,268	251,147	81.7	250,366	98,162
May	11,417,328	9,526,063	83.4	307,268	264,830	86.2	240,395	89,485
June	10,978,200	9,170,955	83.5	295,450	241,028	81.6	231,230	81,880
July	11,417,328	9,045,362	79.2	307,268	236,377	76.9	240,617	88,275
Aug.	11,856,456	9,601,037	81.0	319,086	262,307	82.2	257,318	82,969
Sept.	10,539,072	8,553,104	81.2	283,632	235,962	83.2	247,329	87,304
Oct.	11,856,456	9,495,747	80.1	319,086	264,631	82.9	264,338	85,600
Nov.	10,978,200	*8,479,471	*77.2	295,450	*237,496	80.4	*212,186	*67,174
Dec.	10,978,200	7,672,699	69.9	295,450	186,683	80.4	174,717	59,721
Total (year)	134,812,296	107,973,125	80.1	3,628,126	2,912,903	80.3	2,854,072	.....

Year and Month	Shipments of boxboard	Stocks of boxboard, end of month	Consumption of waste paper		Per cent of Capacity	Stocks of waste paper end of month	
			Capacity	Consumed		At plants	In transit and unshipped purchases
	Short Tons		Short Tons			Short Tons	
1928							
January	196,984	49,032	255,225	189,744	74.3	153,747	62,181
February	209,477	50,350	255,225	193,966	76.0	140,104	60,038
March	237,621	40,439	276,966	209,649	75.7	139,255	47,322
April	220,315	40,319	256,450	211,898	82.6	132,621	47,551
May	235,794	49,107	266,708	220,750	82.8	127,217	46,375
June	223,901	53,560	266,708	204,467	76.7	130,484	43,480
July	203,741	49,969	256,450	190,810	74.4	132,265	62,056
August	233,104	47,709	276,966	213,626	77.1	117,009	48,108
September	228,880	45,271	246,192	217,361	88.3	116,197	53,344
October	246,233	43,627	289,440	240,930	83.2	127,989	73,235
November	236,328	47,693	268,000	222,693	83.1	136,100	49,982
December	197,529	55,624	268,000	196,164	73.2	148,906	43,447
Total (year)	2,669,907	.....	3,182,330	2,512,059	78.9	.....	.....
1929							
January	247,498	56,804	297,440	238,652	80.2	137,251	49,104
February	227,206	57,398	274,560	217,442	79.2	126,212	54,121
March	258,604	54,982	297,440	242,073	81.4	137,008	51,520
April	247,773	57,881	297,440	231,089	77.7	142,666	68,005
May	260,283	62,311	297,440	248,813	83.7	150,048	54,433
June	235,865	62,384	286,000	234,119	81.9	159,005	56,904
July	235,863	63,333	297,440	215,537	72.4	175,306	64,359
August	263,140	61,853	309,231	256,815	83.0	171,360	61,571
September	240,349	58,709	274,560	230,636	87.5	174,884	89,510
October	268,494	59,244	309,231	254,166	82.2	185,169	73,135
November	*236,575	*60,703	286,000	*229,706	*80.3	*193,428	52,851
December	182,204	65,178	286,000	175,905	61.5	198,199	50,380
Total (year)	2,903,854	.....	3,512,782	2,774,953	79.0	.....	.....

* Revised.

Paper Stock Demand Was Unsatisfactory in 1929

Board Manufacturers Experienced Poor Year and Waste Paper Dealers Suffered Accordingly—Packers of Lower Grades Were, in Some Instances, Forced to Sell at Whatever Price Was Obtainable—Better Grades, Including Shavings and Book Stock, Were Fairly Firm—Rag Papers Were in Improved Request, Due to Writing Paper Mills Campaign—Prices Were Steady at First But Declined Later.

By Walter R. Hicks of Daniel M. Hicks, Inc.

WE are standing on the brink of a New Year, or the threshold if you prefer. Whichever it is, it finds us standing, or maybe marking time, for 1930 presents a problem and the country is watching and waiting. The outlook is speculative — but who wants to speculate after last year. "All work and no play makes Jack a dull boy"—but all play and no work makes Jack a Jackass, and the game played took the Jack out of Jackass. There was an overproduction of this specie in 1929. Having been roped in, they are back in harness eager to replenish the feed bucket that was kicked over in the wild gamboling.

Industry has mustered its forces and pledged itself to a program of gigantic expenditures and if carried out will be all to the "mustered." President Hoover's plan for government projects calls for a stupendous outlay of money, and with Industry and Government behind the situation, there is great promise—if they are not too far behind.

1929 was an epoch making year. It went down in history—and in prices. Wall Street broke all records—and most of the investors. President Hoover made things so hot in Washington that the Executive Offices of the White House caught on fire. Byrd reached the South Pole—found it to be a vast area of ice—but will be unable to commercialize his discovery in these days of electric refrigeration. Lindbergh married, and announced his intention to quit flying — which only goes to prove that marriage will bring the best of men to earth.

But what has all this to do with Paper Stock? Nothing much! But nothing much had anything to do with Paper Stock.

Intelligent Business Methods Needed

The collection of Paper Stock was once a business—it is now a hobby. The Rag, Bag and Waste Paper Basket that once symbolized thrift are now mere objects of tidiness. The employment of receptacles for refuse may be a step forward in the march of civilization—but commercially—are the Rag Bag and the Waste Paper Basket to take their place with the Ash Can, the Cuspidor and the Garbage Pail? The gathering of Paper Stock is an industry. It is part of one of the great businesses of the country. Is it an essential part? Would it have its existence if it were not?

The Paper Stock business represents a large investment throughout the country, and investment in business should result in profit. A business must be operated intelligently to figure and realize a profit. With Paper Stock it is the old story. 1929 showed no improvement over 1928 in intelligent business methods. There is yet no organization functioning to improve conditions, and ignorant operation is still the greatest evil in the business. Until the trade is properly organized there will be little improvement in results.

New and Old Rags

New Cuttings were firm throughout the first quarter; all grades being in fairly good demand, but toward summer there were signs of weakening, until in the last quarter they reached levels that were the lowest in some years. The decline in staple cotton had its effect on White Shirts and Hosiery Cuttings, as there was not the demand for breaking up. Paper making was the chief outlet and with an over supply of Cuttings the market adjusted itself downward.

Rag papers were in better demand due to the campaign of the Writing mills, but Sulphite papers will enjoy a ready market as the quality meets the popular demand at a much lower cost to the consumer. Prices ranged from a high of about 12 cents delivered Eastern mills in the early part of the year to a low of about 9½ cents in the closing months, with some sales reported under this figure.

Silesias and Light Flannelettes were in better demand, showing only about one-half a cent between the low of 8 cents per pound in the late months and about 8½ cents in the early months. Blue Overalls and Cheviots were marketable throughout the year at fairly good prices. White Cuttings should steady as there is an increasing demand for export at the present low levels that should have its effect on the market.

There was not the fluctuation in Old Rags, although the market on the whole was not active. Roofing remained fairly firm throughout the year. Fiber Rags were only in fair demand at prices slightly over Roofing. White Rags were in about the strongest position, as desirable Whites were not over plentiful. Good quality Thirds and Blues and Twos and Blues moved in fair volume. The chief market for clean large rags continues to be the Wiping trade and while it has affected the quality of rags for paper making, packers who are putting up special rags for paper making are able to find a ready market.

Good Year for Rope

Rope had a better year than in 1928. It is claimed in the trade that mills who went off Manila Rope and were producing a sheet to compete with Rope Paper out of Kraft and Strings, went back on Rope again which advanced the price of Rope and dropped the price of Strings. This, with the ever increasing demand for Insulating Paper, kept the market in a firm position. Foreign Rope went from about 3½ cents to 5 cents for the best qualities, and Domestic from about 3¾ cents to 5¼ cents.

Bagging of No. 1 Quality remained fairly firm throughout the year, ranging from about $1.50 to $1.70 with paper mills being the chief consumers.

Waste Paper Situation Deplorable

The situation on the whole on waste paper was worse than it has been since 1921, and the market is in a more unsettled condition than that of any other raw material that goes into the manufacture of paper. Shavings and Books were fairly firm, but the volume grades on which most packers depend for livelihood were at no time in good demand, and what demand there was, was at prices that were disastrous to the packer.

The board mills, the biggest factor in the waste paper field, had a poor year and the packer of waste paper suffered accordingly. With Mixed papers at three dollars loaded in the cars.

the packer would lose money if he got the paper for nothing, and yet there were large tonnages sold at that figure. News Manilas and all other board grades dropped in proportion. Many of the packers were caught with contracts, were soon congested, and needed both room and money and had to sell at whatever price was obtainable. Until the board business is in better shape this condition will continue, unless the packers realize and adjust their operations accordingly.

Cheaper to Burn Than Bale

Some producers of waste paper claim a fuel value in their waste papers, and there are others state it is cheaper to burn paper than to bale it up unless they get a price sufficient to make it an object, and at the close of the year many packers were refusing to take waste paper even where they could get it for nothing, and others would only consider carting away waste paper if the producers would pay them for so doing.

The trade has passed through a period that has been a test of endurance. It has been a case of the survival of the fittest, and if your only profit is experience, capitalize it. Keep your determination up, your overhead down, and watch your credits. Remove the bells from your cap, place them back on your wagon, and may they tinkle merrily and verily, vibrating to the tune of Good Business.

GOOD OUTLOOK FOR REX PAPER CO.

Generally better business conditions in 1929 than prevailed during 1928 are reported by Merrill B. King, president of the Rex Paper Company, Kalamazoo, Mich. He adds that the outlook for 1930 is excellent and that the most serious problem that now confronts the manufacturers of coated paper, is what congress may do with the tariff on casein. "Any decided increase in the tariff," said Mr. King, "would be injurious to the mills in this valley."

At the annual meeting all officers and directors were re-elected as follows: Directors, Merrill B. King, Harry C. Bradford, R. B. McCulfor, W. J. Lawrence, Ellen R. King, Kalamazoo; H. H. Creamer, Minneapolis; William Irwin, Columbus, Ind.; president, Merrill B. King; vice president, H. H. Creamer; secretary, Harry C. Bradford; treasurer, R. B. McCulfor.

MURALS IN NEW CROWN-ZELLERBACH BUILDING

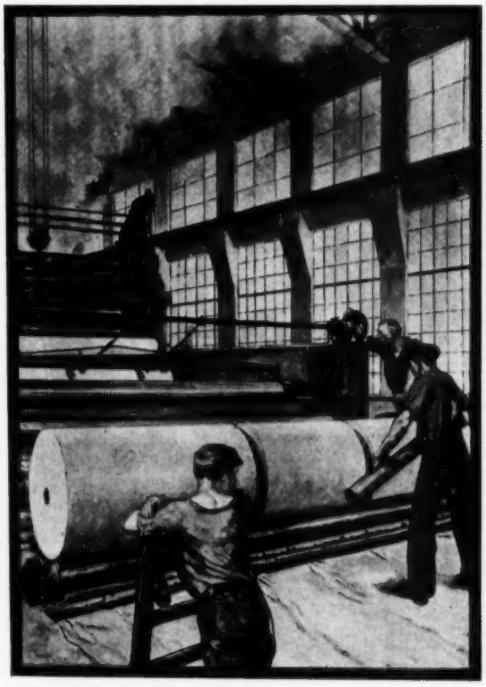
The last two panels in the series of ten murals painted by Warren Chase Merritt for the Crown Zellerbach Company board room, in San Francisco, are reproduced here. One shows a scene in the actual making of paper and the other pictures the shipping of finished paper from the San Francisco docks.

The paper mill panel presents the dry end of a paper machine where the finished newsprint is turned out in great rolls. The logs shown in the first two production panels have been chipped, beaten into pulp, knit into paper, dried and rolled into newsprint. Here it is ready to be wrapped and shipped to the newspapers for the printing of your favorite daily.

From the painting that shows the loading of a vessel with paper, one comes to realize the extent of the paper industry throughout the world. Millions of pounds of paper are continually being carried to all parts of the globe by ships such as the one pictured by Merritt. Winches are turning, cranes are creaking as huge rolls and heavy bales of paper are swung into the holds of ocean-going liners that carry this modern necessity to every country.

In these, as in the others of the ten panels, the artist has emphasized the human element that enters into the paper industry.

He has painted strong types of men. He has pictured the making of paper not as a cold matter-of-fact industry but as a human endeavor relying on the efforts of men of past ages and the honest toil of men today.



TWO OF A SERIES OF TEN MURALS PAINTED BY WARREN CHASE MERRITT

Paper Coming From Dry End of Machine. **Shipping Paper From San Francisco Dock.**

News Print Industry Expands Further in Canada

Eight Machines Added to Productive Capacity in 1929, Represented Increased Output of More Than 1,000 Tons Daily—Following Opening of Dalhousie Mill With Production of 250 Tons, Only One More Plant, at Buckingham, Que., Also With Output of 250 Tons Per Day, Is Under Construction in Eastern Canada—Should Consumption Continue to Expand, Conditions in News Print Industry Would Improve.

By C. L. Sibley, Regular Correspondent of the Paper Trade Journal.

OVER-EXPANSION in every department of the pulp and paper industry in Canada, and more particularly in the production of news print, still spreads its blighting effect on the pulp and paper industry in Canada. But for that fact the year 1929 would have gone down in history as the most prosperous the industry had ever known, for markets for all pulp and paper products showed an enlargement beyond the fondest hopes. Never before has the aggregate sales been so large, yet the fact remains that competition has kept the prices so low that the business has largely been unremunerative to those who have their capital invested in it.

The wave of expansion which began around 1919-1920, when prices for news print reached from $125 to $140 per ton, and when everybody was scrambling to get in on a good thing, has proved much harder to stop than it was to begin. The Provincial Governments of Quebec and Ontario, seeing a fine opportunity to add to their revenues by capitalizing on their immense forest reserves, leased pulpwood limits right and left both to existing pulp and paper companies and to new organizations, and invariably put clauses in their leases binding the companies to erect pulp and paper mills and bring them into operation on specified dates. These were hard and fast contracts, and the penalty for failure to live up to them was cancellation of the leases. For a time everything was rosy, but it soon began to be apparent that the industry was expanding faster than consumption. The price began to drop steadily, but the works set in motion by the expenditures of millions upon millions of capital did not stop. The development of power sites already in progress could not be arrested without entailing huge losses, the construction of mills for which the power was being developed had to go ahead or the power would be useless, machines and other equipment for which orders were placed had to be completed, and as new machines one after the other came into operation, their quota of products had to be put on the market.

Before the folly of this tremendous expansion became fully apparent, the provinces of Nova Scotia and New Brunswick, which for years had been lagging behind in the industrial race, entered into the field, and during the past twelve months they too have entered the market with added quotas of news print.

A 1000-ton Increase in Capacity

During the past year the total productive capacity of Canadian news print mills has been increased by well over 1,000 tons per day, eight new machines having been added to the existing capacity. This represents an addition of some 10 per cent to the capacity as it existed at the end of 1928. The wave of expansion, however, has not yet spent its force, although the situation is much clearer now. Following upon the opening of the Dalhousie mill of the International Paper Company in New Brunswick, with a production of 250 tons per day, with which the year 1930 has been inaugurated, there now remains only one other large news print plant in process of construction in Eastern Canada, namely that of the James MacLaren Company, at Buckingham, Que., which will have a production of 250 tons of news print. As a result of an arrangement with the Provincial Government, in view of the existing situation, this mill will not come into production until towards the end of the present year. Therefore, the industry has not the large overhanging potential tonnage that it had at the beginning of last year, and if the market continues to expand at the rate that it has shown during the year just closed, it may be that by next year there will be a turn towards more hopeful things in the industry.

Outside Factors Complicate Outlook

However, the fact that the wave of expansion in Eastern Canada appears to be coming definitely into sight does not entirely remove the clouds on the horizon. Lord Beaverbrook is building a new paper mill in England which will cut off a prospective demand for 60,000 tons of Canadian news print, unless the output is absorbed by increased consumption, and the new news print mill in the New England States will complicate matters also.

In addition, by the irony of fate, it looks as though Labrador, which was formerly regarded as a portion of Quebec Province, but which the Privy Council sometime ago awarded to Newfoundland, will become a competitor of importance in the news print market. Sir William Coaker, a member of Newfoundland's Executive Committee, has announced that negotiations are in progress with a syndicate representing English and Canadian interests looking to the acquisition by the latter of exclusive rights in the development of Labrador, which will naturally entail development of its forest resources along the lines of those in Quebec Province.

In connection with these proposals, Sir William announced that consideration is being given to a proposition involving the construction of a news print mill with an output of 1,000 tons per day on the Gander River in Newfoundland. The Hearst newspapers, he stated, were back of this plan, which involved the awarding of timber rights in Labrador as well as in Newfoundland.

Then there has been the threat of the American newspaper publishers to encourage the import of news print from the Scandinavian countries, even to the extent of investing in new mills there. This threat, however, is not taken seriously by the Canadian news print interests, who are as thoroughly acquainted with conditions in the industry in Norway, Sweden, and Finland as they are with conditions here. They state that the governments of the Scandinavian countries all limit the cut of pulpwood to the amount of the annual increment through growth, and that the cut is already equal to the annual growth. Therefore, they contend, no serious amount of news print could be imported from that source.

Production the Greatest on Record

In matter of volume, the output of Canadian news print mills in 1929 exceeded all previous records by a considerable margin, as is shown by the fact that despite the increase in capacity, the average output in relation to capacity has not fallen below the standard of 1928, namely 82 per cent. This was brought about by an increased demand from the United States owing partly to pros-

perous business conditions, and partly to a decrease in the production of news print in that country, a deficiency which the Canadian mills were called upon to supply. Then again there was a moderate, though not large increase in the supply of news print to England, Australia, New Zealand and South America, amounting in all to some 300,000 tons. The total production of Canadian news print mills for 1929 was 2,728,827 tons, an increase of 347,725 tons over the production of the previous year. This gave a ratio of production to installed capacity for the entire year of 85.5 per cent. The production for 1928 was 2,381,102 tons.

Exports of Pulp and Paper Increase

For the year 1929 the total value of pulp and paper exported from Canada amounted to $198,287,106 as compared with $192,771,615 in 1928, an increase for the year of $5,515,491.

Exports of wood pulp for the year were valued at $43,577,021 which was a decline of $2,037,802 from the total for the year 1928. Exports of paper in 1929 were valued at $154,710,085 as compared with $147,156,792 in 1928, an increase for last year of $7,553,293.

Details of exports for the years 1929 and 1928 are as follows:

	Year 1929		Year 1928	
PULP:	Tons	$	Tons	$
Mechanical	209,331	5,906,638	203,670	5,546,120
Sulphite bleached	253,810	19,246,692	251,543	19,112,964
Sulphite unbleached	201,839	9,923,016	214,127	10,738,977
Sulphate	134,321	7,856,486	162,772	9,595,866
Screenings	36,408	644,189	31,694	620,896
	835,709	43,577,021	863,806	45,614,823
PAPER:				
News print	2,510,633	148,656,611	2,206,587	141,103,527
Wrapping	14,903	1,628,261	16,062	1,755,652
Book (cwts.)	74,052	632,660	71,802	588,671
Writing (cwts.)	4,170	38,968	4,702	44,629
All other	.....	3,753,585	.....	3,664,313
	.....	154,710,085	.....	147,156,792

Exports of pulpwood in 1929 were smaller than for some years past, the total quantity shipped being 1,294,995 cords valued at $13,314,738 as compared with 1928 exports of 1,532,266 cords valued at $16,269,660.

Agreement Stabilized the Price

Fortunately for the industry, there was throughout 1930 a general though not entirely unanimous nor thoroughly harmonious agreement between the leading news print concerns by which the price was stabilized at $55 per ton for most of the production, and by which the tonnage was more or less evenly distributed between the different mills. This prevented cut-throat competition from developing, and undoubtedly prevented some of the weaker concerns from closing down or going into bankruptcy. This more or less general arrangement, it is hoped, will be continued for the present year, though nothing like certainty in the outlook yet prevails.

For months prior to the end of 1929 negotiations were in progress between the various large producers, and between them and the provincial Government of Quebec and Ontario—which latter recognized the dangers of the situation—looking to an increase in the price of news print for 1930, the objective openly sought being $60 per ton. For a time it looked as though these negotiations might be successful. Indeed several of the larger Canadian concerns went so far as to announce that the price for 1930 would be $60 per ton, with a condition that for three-year contracts this price would not go into effect until the last six months of 1930. The International Paper Company, however, was not a party to this agreement, nor were some of the newer paper-producing concerns in Canada which had to fight their way into the market, possibly because it had a new 250-ton mill just coming into production in New Brunswick, and possibly also because of the general situation which had developed because of the crash in the stock markets, the International Paper Company finally announced that its price would remain at $55 per ton for the first six months of 1930, prior to the expiration of which time its prices for the remaining six months of the year would be announced. Much therefore will depend on conditions as they develop. Meanwhile the Canadian companies have withdrawn their increase in prices

The New Developments

It has already been stated that eight new machines were added to productive capacity during the past year, but really there were ten, counting the two in the Dalhousie mill, which was ready for production at the end of the year, and which has since been opened. Four of these ten were in new mills, the mill of the Mersey Paper Company, at Liverpool, N. S., and the International's mill at Dalhousie, N. B. The other six were installed in mills already established.

The largest amount of development in the industry during the year took place in New Brunswick, consequent upon the development of the Grand Falls on the Saint John River. In addition to the new mill at Dalhousie, a new machine was added at the mill of the Bathurst Power and Paper Company, and various other additions were made to existing pulp plants. The Fraser Companies, for instance, expanded their existing plants for the manufacture of pulp and paper board, and are at present building a new sulphite mill at Athol, N. B., which will shortly be in operation. The pulp from this mill will be carried across the international border by pipe line to be manufactured into paper in a mill in Maine. Other large developments are planned in New Brunswick, principally by the International Paper Company. These include the building of a pulp and paper plant on the Restigouche, the Upper St. John and the Miramichi rivers, the building of a bleached sulphite plant at Chatham, N. B., of about 100 tons capacity, and the building of a pulp plant at St. Leonard, N. B., from which the pulp will be conveyed across the St. John River, which forms the international boundary at that point, to a paper manufacturing plant at Van Buren on the Maine side of the river. These plans, however, are said to be in abeyance for the present, owing to the state of the market.

The new mill of the Mersey Paper Company, at Liverpool, N. S., is the first news print mill to be established in that Province. It will prove a valuable asset to Nova Scotia, as it will consume a good deal of pulpwood that might otherwise be exported or not used; it will give employment to a large number of workers both in the mill and in the woods; and it is one step in the industrial development of the Maritime provinces which has long been needed.

Marked Progress in Consolidation

A feature of the year has been marked progress in the movement towards consolidation. Various companies have been merged into the larger organizations, and it is increasingly evident that as far as the news print industry is concerned, that will soon be almost entirely in the hands of three or four powerful groups. This means greater efficiency and large savings in operating methods and costs. There is also a tendency to diversify products, and in this connection pulp and paper concerns not identified with the news print industry are being taken over by the larger news print concerns. In this connection the same policy that governs the International Paper Company is also apparent, for that company not only has a great diversity of products, but is consolidating its position by large revenues derived from its enterprise as a producer of hydro-electric power.

What has been said regarding the pulp and paper industry applies mainly to Eastern Canada, but the fact should not be lost sight of that in addition considerable expansion is taking place in the West, and notably in British Columbia, where prospects would seem to warrent expansion. The recent granting of water power rights on the Lois River to the Powell River Company will lead to a large capital expenditure on this source of energy, to be followed by notable additions to the paper-producing capacity of the company. Several other projects are planned or under consideration in that Province, and it looks as if the industry there is starting on a period of considerable expansion.

Dry Summer Helps Pulp

In regard to the production of pulp, Canadian mills were somewhat busier in 1929 than in the previous year, the dry summer

having resulted in an improved demand for mechanical pulp, and the increased output of paper calling for a corresponding increase in pulp production. Exports of pulp, except mechanical pulp, were not quite as large as in the previous year, but this was not necessarily an unfavorable development, as the tendency is to the use of a larger proportion in the domestic manufacture of paper. Extensions were made to several pulp-producing plants, thereby increasing the productive capacity of Canadian mills in pulp for artificial silk—now an important industry for the Dominion—and in other grades of wood pulp.

For grades of paper other than news print, the operations of Canadian mills are confined largely to the domestic market, only small quantities being exported, principally to countries within the British Empire. As business generally has been prosperous, there has been a good demand for paper of all kinds. The mills making book, writing, wrapping, paper board and other grades of paper have been actively employed throughout the year. There has been considerable expansion, however, and the general state of the industry is not as good as it might be. Probably this has been the cause for several consolidations which have taken place with the general purpose of increasing efficiency and decreasing cost.

Conserving Forest Resources

Taken as a whole, it may be said that the forest industries of Canada continued on a high level of activity during the year. Twelve months of unprecedented activity and expansion in the construction and building industries contributed to this activity by making large demands for lumber and paper board products. This was offset to some extent by the increasing use of substitutes for lumber, but on the whole the indications are that the production of lumber was slightly increased, although there was perhaps a slight decrease in exports.

Perhaps the most important step taken during the year still further to promote the progress of forest industries was the arrangement arrived at by which the Provinces and the Dominion will cooperate in the basic work of making a detailed inventory of Canada's forest resources.

The unusual severity of the fire season in 1929 has been a practical though costly illustration of the great danger which threatens our forest resources in seasons of high fire hazard. Though the lesson has been carried to the public in many ways during the last eight years through the publicity efforts of the Forest Service, the results as regards the curtailment of preventable forest fires have not been as satisfactory as is necessary if Canada is to balance her average annual cut of 2,700 million cubic feet of standing timber with natural increment.

Science is working to promote better methods of utilization, and to reduce losses through insects and decay, and the organized fire-fighting forces are confident that they can adequately cope with any situation due to natural causes. It is as regards the preventable fires that public cooperation is so necessary.

Each year the industries dependent for their raw materials upon the forests call for greater supplies. The value of the production for the group of manufacturing industries using wood and paper as their principal component materials was in round figures $630,000,000 for 1927, the last year for which complete returns are available. This compares with $600,000,000 for 1926 and $557,000,000 for 1925. Nevertheless, according to the Hon. Charles Stewart, Minister for the Department of the Interior, Canada has sufficient readily accessible forest land to produce in perpetuity several times the present annual cut, and to sustain forest products industries of much greater capacity than exist today, provided the preventable losses and unnecessary waste referred to are overcome.

Water Power Development

Closely associated with the progress of the pulp and paper industry—and indeed an integral element of it—is the development of hydro-electric power. As a matter of fact, most of the larger pulp and paper producers in this country are themselves large producers of hydro-electric power. The outstanding example is the International Paper Company. It is quite apparent that this company has a settled policy to balance the fluctuating and at times speculative activity of paper making with the steady and apparently assured revenues which come from the supply of electric current. Starting, therefore, with the development of hydro-electric energy to supply the motive power in its own mills, it has gradually extended this subsidiary field of enterprise until now it is not only a power producer on a large scale in the New England States, but is one of the largest power producers in Canada. Other pulp and paper companies have adopted the same policy, so that now it would seem that power and paper production must be regarded as twin industries.

The total capacity of new water-power installations completed and brought into operation in Canada during 1929 amounts to 378,400 h.p., bringing the total installations for the whole Dominion to a figure of 5,727,600 h.p. There are, as well, a number of important undertakings under active construction, which, it is expected, will add more than 1,600,000 h.p. to this total during the next three years. In many of these undertakings an initial installation only is involved and when they are ultimately completed to their full designed capacities, a further 1,500,000 h.p. will be added to Canada's total. Studies are also being made of a number of important projects, some of which will undoubtedly be undertaken within the next few years.

These hydro-electric activities constitute a large part of the building construction program throughout the Dominion and the total outlay of capital involved in the development, transmission, and distribution of the new power developed in 1929 amounted to probably more than $75,000,000, while not less than $320,000,000 will be required to complete the undertakings planned for the next three years.

Quebec Took the Lead

During 1929 Quebec again took the lead in works completed and the same is true of the works at present under construction, but important programs are also under way in practically all the other provinces.

In Quebec the Gatineau Power Company, a subsidiary of the International Paper Company, added one unit each to its plants at Chelsea and Farmers on the Gatineau River of 34,000 h.p. and 24,000 h.p. respectively, and a unit of 25,000 h.p. to its Bryson plant on the Ottawa River. The Shawinigan Water and Power Company, which supplies so many of the pulp and paper mills in the St. Maurice and Quebec City district, added a 43,000 h.p. unit to its Shawinigan Falls plant, and a new development of 72,000 h.p. capacity was brought into operation on Des Prairies River near Montreal by the Montreal Island Power Company. The City of Sherbrooke brought into operation a new plant of 5,800 h.p. at Westbury on the St. Francis River and the Southern Canada Power Company one of 2,000 h.p. at Ayers Cliff on the Nigger River. Other smaller installations were also completed during the year in various parts of the province. Among large projects under way are those of the Alcoa Power Company on the Saguenay River with an initial installation of 260,000 h.p., the Beauharnois Light, Heat and Power Company on the St. Lawrence River with an installation of 500,000 h.p., and the James MacLaren Company on the Lievre River with an initial capacity of 90,000 and an ultimate designed capacity of 120,000 h.p. A portion of this is to be used for the 250-ton news print mill now in process of construction. The Shawinigan Water and Power Company is also planning further large developments on the St. Maurice River.

Developments in Ontario

In Ontario the Hydro-Electric Power Commission completed a 2,200 h.p. development on the South Muskoka River at Trethewey

Falls, one of 1,800 h.p. at Elliott Chute on the South River, and one of 5,000 h.p. at Lower Ear Falls on the English River. Work was also advanced on the 54,000 h.p. development at Alexander Landing on the Nipigon River, on the installation of a tenth unit of 58,000 h.p. in the Queenston station on the Niagara River, and on the duplication of the 220,000-volt transmission line bringing Gatineau River power to Toronto. The Commission took an additional 76,000 h.p. during 1929 under its contract with the Gatineau Power Company. A new contract for 250,000 h.p. was also made with the Beauharnois Light, Heat and Power Company, delivery to commence in 1932. In northern Ontario the International Nickel Company of Canada completed its 28,200 h.p. development at Big Eddy dam on the Spanish River and the Algoma District Power Company brought into operation a new plant at High Falls on the Michipicoten River with an initial installation of 11,000 h.p.

Maritime Provinces Make Progress

In New Brunswick the Saint John River Power Company added the second and third units of 20,000 h.p. each to its Grand Falls development on the Saint John River, part of which power is being used by the new Dalhousie paper mill of the International Paper Company, and the Bathurst Power and Paper Company added a 5,500 h.p. unit to its plant on the Nipisiguit River.

In Nova Scotia the Nova Scotia Power Commission completed three new plants on the Mersey River with installations totaling 30,900 h.p., part of which is being used by the new mill of the Mersey Paper Company, and one on the Tusket River with 3,000 h.p. The Avon River Power Company completed a development of 500 h.p. on the Fall River and commenced construction of a new 4,500 h.p. plant on the Black River.

Big Developments in the West

In British Columbia, the British Columbia Power Corporation, through its subsidiaries, commenced construction of a new 188,000 h.p. development at Ruskin on the Stave River, advanced construction of the large Bridge River project which is expected to come into operation in 1932 with an initial installation of 80,000 h.p., and completed an automatically operated plant of 2,000 h.p. at the Jordan River diversion dam on Vancouver Island. The City of Nelson added 3,000 h.p. to its plant on the Kootenay River and the Powell River Company commenced work on an 18,000 h.p. development on Lois River. Other large developments are contemplated by the West Kootenay Power and Light Company on the Adams and Pend d'Oreille Rivers, by the British Columbia Power Corporation on Campbell River, and by the East Kootenay Power Company on the Elk River.

In Alberta the Calgary Power Company completed and brought into operation its 36,000 h.p. Ghost development on the Bow River and widely extended its transmission system throughout the province.

In Saskatchewan good progress was made with the construction of the Island Falls development of the Churchill River Power Company which will bring 24,000 h.p. into operation in 1930 to supply the Flin Flon and Sherritt Gordon mines.

In Manitoba the Northwestern Power Company advanced construction on the 225,000 h.p. Seven Sisters development on the Winnipeg River which is expected to come into operaton with 112,500 h.p. capacity in July, 1931, while the Slave Falls development of the City of Winnipeg on the same river was commenced. The city plans to bring 25,000 h.p. into operation at this plant in 1931, the designed capacity being 100,000 h.p.

JAPAN PROGRESSES IN PAPER MAKING

The Japanese have made remarkable strides during recent years in the manufacture of machine-made paper, according to a study of the paper trade of Japan which the Commerce Department has just issued as a trade bulletin. At the present time, the bulletin declares, Japan ranks with the leading paper-producing countries in volume of output, being surpassed only by the United States, Germany, the United Kingdom and Canada.

The manufacture of machine-made paper ranks among the most progressive and prosperous of Japanese industries, the report points out. An ample supply of working capital, together with an efficient management has in most cases insured the plants being equipped with the best modern machinery and labor-saving devices; its forests provide an abundant supply of pulpwood and its numerous waterfalls make the industry independent of foreign sources of supply of basic raw materials and power.

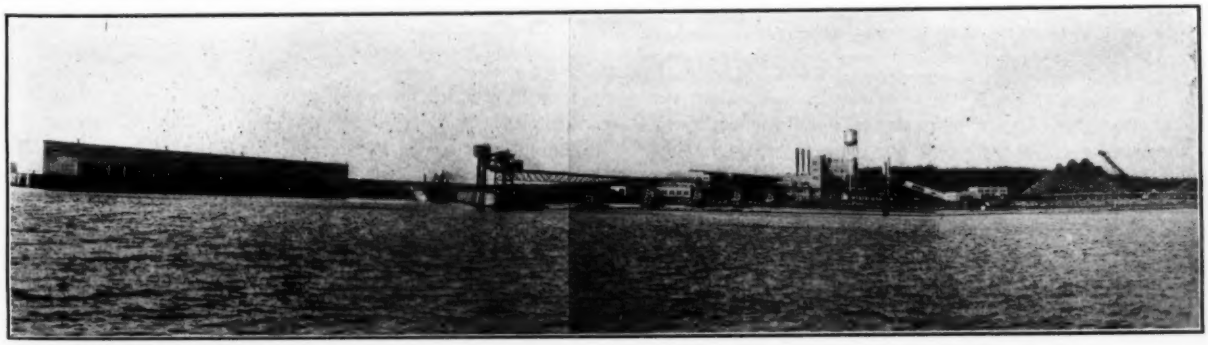
Japanese output, however, is confined largely to printing papers, particularly news print, the report shows. Notwithstanding the important domestic industry, the Japanese market each year absorbs between $7,000,000 and $10,000,000 worth of imported paper and paper products. The American share in this trade has averaged somewhat less than 10 per cent annually, as against 25 per cent to 35 per cent enjoyed by Sweden and approximately 20 per cent each by the United Kingdom and Germany. Japan is strictly a price market, it is pointed out, and the greatest demand is for the medium and cheaper varieties.

OUTPUT 44 PER CENT OVER 1928

The International Hydro-Electric System, a division of the International Paper and Power Company, produced 3,840,565,000 kilowatt hours of electric energy in 1929, 44 per cent greater than the output of the system in 1928, and two and one-third times that in the year 1927.

In December the output of the International Hydro-Electric System was 345,384,000 kilowatt hours, 19 per cent over December, 1928, and 70 per cent greater than in December, 1927.

In the first eleven months of last year—the latest figures available—the combined output of electric energy of all central station power plants in the United States and Canada increased 11 per cent over that in the first eleven months of 1928, while the output of the present plants of International Hydro-Electric System increased 19 per cent in the same period.



PLANT JUST STARTED OF THE MERSEY PAPER CO., LIVERPOOL, N. S.

Ontario Paper Industry Had Satisfactory Year

Manufacturing Activity Well Maintained In Practically All Branches With Expansion In Some Directions—Volume of Business Transacted by Distributors Surpassed Expectations—Fine Paper Section Enjoyed Particularly Active Twelve Months—While Coarse Paper Division Was Dull During Bulk of Year, Demand Improved Considerably In Last Quarter—Stage Appears All Set for Still Greater Activity.

By G. W. Brock, Regular Correspondent of the Paper Trade Journal

THE paper industry of Ontario closed 1929 with a satisfactory volume of business and one which surpassed expectations. In common with business conditions generally the industry suffered a set-back during part of the last quarter due to the stock market crash but the effects of this soon spent themselves and before the year ended business was swinging along steadily. In most quarters the feeling prevails that had the general slump not come during the Fall the year would have been a record one for paper sales. Practically all of the distributors had a good year as it was—particularly those handling fine papers, and the last quarter of the year saw some improvements in the coarse paper market which had been rather dull throughout the bulk of the year. It was a good year for the board mills and the paper box industry and light weight papers were in good demand throughout the twelve months of the old year. In paper manufacturing circles activity has been well maintained and in practically all branches prosperity has prevailed and expansion in some directions recorded. It has been a year of mergers and combination of interests in the pulp and paper field and it would appear as if the stage were all set now for still greater activity and consolidation in the industry during the present year.

Excessive News Print Productive Capacity

The prosperity of the pulp and paper industry is intimately related to the general business situation throughout the country, and in some branches of the industry to the situation in the United States, which forms the most important market for our news print and wood pulp. Conditions in the United States have been very similar to those in Canada and these conditions have their influence upon the pulp and paper industry. Generally speaking the year was fairly satisfactory and there has been a good deal of expansion and progress, although the news print industry has been operating under difficulties, which have, to some extent, cast a shadow over the pulp and paper industry as a whole. The news print mills began the year under the handicap of an excessive productive capacity, and while the output in 1929 surpassed all previous records, the mills were able to operate at an average of only about 85 per cent of capacity, and the financial returns were not in proportion to the increase in production. Since the beginning of 1926 Canada has been the world's largest producer of news print, and each successive year has seen this lead increased. In the first eleven months of 1929 the output of Canadian news print mills amounted to 2,495,628 tons, which was an increase of 322,130 tons, or 15 per cent, over the corresponding period of 1928. As an indication of the development that has taken place in this branch of the industry, it may be pointed out that the total output for 1929 was more than double the output of 1924, an increase of over 100 per cent in five years.

Exports Are Considerably Greater

The demand for news print was well maintained during the year, both in the United States and in the overseas markets. The greater part of the Canadian production is exported to the United States, and the mills in that country produced less news print in 1929 than in 1928, thus increasing the demand for Canadian paper. Exports to the United States for the ten months ending October 31, the latest figures available, amounted to 1,778,353 tons, as compared with 1,590,639 tons shipped to that country in the corresponding months of 1928. There was also, during the year, a considerable increase in the shipments to overseas countries, mainly to England, Australia, New Zealand, South Africa and South America, and in the ten-months period these exports amounted to 282,969 tons, which was an increase of 76,370 tons over the total for these months in 1928.

More Finished Products

The export of pulp and paper plays an important part in the prosperity of the industry and in the economic welfare of the Dominion, and in the past year the value of these exports was greater than in any previous year. For the first ten months of the year the total value of wood pulp and paper exported from Canada amounted to $163,514,218, as compared with a total of $157,889,459 in the corresponding ten months of 1928. There was a decline in this period in the value of wood pulp exports, but this decline was more than offset by the increase in the value of finished paper exported. Exports of chemical pulp were smaller in 1929 than in the previous year, but there was an increase in the shipments of mechanical pulp, for which grade there was a larger demand due to a dry season, which curtailed production in some districts.

Canadian production of sulphite pulp continues to expand, and new mills at present under construction will add to the productive capacity in the coming year.

The annual report of the industry for 1928 emphasized the important place occupied by pulp and paper in the structure of Canadian development. The capital invested in the industry for that year amounted to $685,687,459, which was an increase of 18.3 per cent over the total for 1927.

British Columbia Looks For Big Year

The greatest expansion in the industry during the past year has taken place in the Maritime Provinces, and a good deal of the work in that connection is now completed or approaching completion. For the coming year it would seem that the principal developments will be in British Columbia where considerable expansion is planned. The recent granting of power rights on the Lois River has enabled the Powell River Company to proceed with plans to enlarge the capacity of its mills and the new work involved calls for an expenditure of close to $6,000,000. There are several other programs for extension and building in the Province and there will be considerable activity in this direction during the present year.

Present indications are that business conditions during the present year will be satisfactory, although it is doubtful if the high level of the past two years will be fully maintained, while the influence of the stock market crash will undoubtedly be felt. Fundamental conditions in Canada are sound and while the past two or three years have been prosperous there has been no boom, but a period of steady progress and upbuilding so that any drastic decline is unlikely. The prosperity of the pulp and paper industry is dependent upon the general prosperity of the Dominion and the United States, and so far as can be seen at present there is nothing to indicate that conditions during 1930 will be anything but saisfactory.

Pulpwood Consumption and Wood Pulp Production

Annual Report for 1928 Prepared by the Bureau of the Census of the U. S. Deparment of Commerce in Cooperation with the Forest Service of the U. S. Department of Agriculture—Comparisons with Previous Census Years and State Statistics—Figures on Increased Consumption, Condition in Which Wood Is Purchased, Methods of Manufacture, Average Value of Pulp Per Ton and Imports and Exports.

U. S. Department of Commerce Report

THIS report is one of a series of annual reports on pulpwood consumption and wood pulp production published by the Bureau of the Census of the U. S. Department of Commerce in cooperation with the Forest Service of the U. S. Department of Agriculture. The statistics are here presented, so far as possible, in the same form as in reports for preceding years in order to preserve their comparability.

State Statistics

In Tables 5, 6, 9, and 10 statistics are given for each State for which separate figures can be given without disclosing data for individual establishments, which is prohibited by the census law. Both California and Oregon, for which the figures are combined, and certain of the "Other States," reported the consumption of larger amounts of pulpwood or the production of larger amounts of wood pulp than some of the States for which separate statistics are presented.

Pulpwood Consumption

The consumption of pulpwood reached a new high level in 1928, and for the first time in the history of the industry in the United States the annual consumption exceeded seven million cords. The greatest increases were shown for the West Coast States—Washington, Oregon, and California—and for Louisiana.

The wood used is purchased either rough, peeled, or rossed. Wood purchased rough (with the bark on) contributed 41.9 per cent of the total quantity consumed in 1928; peeled wood, 52.4 per cent, and rossed wood, 5.7 per cent. The peeling process is performed by hand, and no part of the wood fiber is wasted. The proportion of wood fiber lost in the rossing of bolts of small diameter is, however, considerable.

The figures shown in Tables 11 and 12 in the report on pulpwood consumption and wood pulp production, were taken from the Summary of Imports and Exports of the United States, published by the Bureau of Foreign and Domestic Commerce, Department of Commerce, and are included in this report for ready reference. All quantities of pulp and paper have been reduced to tons of 2,000 pounds for convenience in making comparisons.

The following statement shows, for 1928, 1927, and 1926, the percentage of the total consumption of pulpwood reduced by each process:

Year	Total pulpwood consumed (cords)	Per cent of total reduced by specified process: Sulphite	Mechanical	Sulphate	Soda	Semi-chemical
1928	7,160,100	44.6	21.8	20.0	13.0	0.6
1927	6,750,935	45.8	23.2	17.5	13.3	.2
1926	6,766,007	46.5	25.5	14.7	13.3	(1)

[1] Not reported.

Wood-Pulp Production

The statistics show decreases in the per cent of pulp produced by the mechanical, sulphite, and soda processes and increases in the production by the sulphate and semichemical processes. The increase in the production of sulphate pulp is noteworthy and is in line with the increased consumption of southern yellow pine, which is pulped principally by the sulphate process.

The following statement shows, for 1928, 1927, and 1926, the percentage of the total quantity of wood pulp produced by each process:

Year	Total wood pulp produced (tons, 2,000 lbs.)	Per cent of total produced by specified process: Mechanical	Sulphite	Soda	Sulphate	Semi-chemical	Screenings
1928	4,510,800	35.7	34.6	10.8	17.2	0.7	1.0
1927	4,913,405	37.3	36.0	11.3	14.0	.3	1.1
1926	4,394,766	40.1	35.5	11.3	11.8	(1)	1.3

[1] Not reported.

The average values of pulp presented in the statement below are based on the total quantities and total values reported. They are not strictly comparable, however, because in some cases the actual production costs were reported instead of the estimated market values of pulp f.o.b. mill. The questionnaire used for collecting the statistical data for 1926 and 1928 carried the following note: "Where pulp is consumed at mill and not sold, please state production cost of price charged to paper plant, and indicate with letters 'P. C.'" The questionnaire used for 1927 called only for the estimated market value f.o.b. mill.

	Average value of pulp per ton [1]: Mechanical: Not steamed	Mechanical: Steamed	Sulphite: Unbleached	Sulphite: Bleached	Sulphate: Unbleached	Sulphate: Bleached	Soda: Unbleached and bleached	Semi-chemical
1928	$27.20	$26.83	$47.58	$76.94	$41.93	$68.82	$72.08	$44.10
1927	27.36	37.88	51.42	79.15	47.37	(2)	67.37	42.24
1926	28.38	30.51	51.56	80.68	48.05	(2)	70.04	(3)

[1] See "Average value of pulp per ton" above.
[2] Not shown separately in order to avoid disclosing the output of individual establishments.
[3] Not reported.

The figures for imports of pulpwood are not comparable with those for imported pulpwood used, compiled by the Bureau of the Census, for the reason that the statistics on pulpwood consumption pertain solely to the quantities used during the calendar year, which in the cases of many mills included some stock imported in previous years and excluded some imported but not consumed during the year to which the statistics relate.

TABLE 1
PULPWOOD CONSUMPTION, BY QUANTITY AND COST, FOR THE UNITED STATES, FOR SPECIFIED YEARS: 1899 TO 1928

Year	Quantity (cords)	Cost (f.o.b mill): Total	Average per cord
1928	7,160,100	$97,024,190	$13.55
1927	6,750,935	95,452,365	14.14
1926	6,766,007	101,229,402	14.96
1925	6,093,821	94,339,540	15.48
1924	5,768,082	92,671,688	16.07
1923	5,872,870	95,306,283	16.23
1922	5,548,842	89,895,191	16.20
1921	4,557,179	91,589,103	20.10
1920	6,114,072	116,495,720	19.05
1919	5,477,832	87,386,083	15.95
1918	5,250,794	73,167,118	13.93
1917	5,480,075	60,815,057	11.10
1916	5,228,558	[1] 45,785,682	8.76
1914	4,470,763	39,408,453	8.81
1911	4,328,052	.....	....
1910	4,094,306	.....	....
1909	4,001,607	34,477,540	8.62
1908	3,346,953	28,047,473	8.38
1907	3,962,660	32,360,276	8.17
1906	3,661,176	26,411,887	7.21
1905	3,192,123	17,735,665	5.56
1899	1,986,310	9,837,516	4.95

[1] Not including slabs and other mill waste in Louisiana, Massachusetts, North Carolina, and Virginia.

TABLE 4.—PULPWOOD CONSUMPTION—QUANTITY AND AVERAGE COST PER CORD, BY CONDITION IN WHICH PURCHASED AND BY KIND OF WOOD, FOR THE UNITED STATES: 1928

Kind of Wood	Total		Rough		Peeled		Rossed	
	Quantity (cords)	Average cost per cord (f. o. b. mill)	Quantity (cords)	Average cost per cord (f. o. b. mill)	Quantity (cords)	Average cost per cord (f. o. b. mill)	Quantity (cords)	Average cost per cord (f. o. b. mill)
Total	[1] 7,160,100	$13.55	3,000,764	$11.19	3,750,929	$15.66	408,407	$11.58
Spruce:								
Domestic	2,000,433	17.04	809,519	14.73	1,174,405	18.50	16,509	19.22
Imported	1,063,348	19.21	274,977	17.28	693,271	19.76	95,100	20.80
Hemlock:								
Domestic	1,158,958	10.63	704,528	10.18	413,570	11.21	40,860	12.50
Imported	18,677	11.92	11,463	10.24	7,214	14.59	.....	....
Yellow pine, southern	925,698	7.68	559,124	6.16	366,574	10.00	.....	....
Poplar:								
Domestic	225,194	13.59	34,766	9.08	190,428	14.41	.....	....
Imported	199,871	16.68	.....	....	199,871	16.68	.....	....
Balsam fir:								
Domestic	257,379	13.51	162,246	11.58	92,316	16.95	2,817	11.85
Imported	102,287	18.12	19,298	15.89	38,111	18.77	44,878	18.52
Jack pine	[2] 175,957	11.20	130,439	10.75	19,898	16.02	25,620	9.74
Yellow poplar	122,738	12.23	53	9.32	122,685	12.23	.....	....
White fir	105,161	9.83	56,609	12.10	48,552	8.48	.....	....
Beech, birch, and maple:								
Domestic	65,227	14.37	34	8.00	65,193	14.37	.....	....
Imported	17,100	14.27	3,100	12.10	14,000	14.75	.....	....
Gum	72,611	12.69	.....	....	72,611	12.69	.....	....
Tamarack (larch)	67,394	12.53	61,455	12.19	5,939	16.00	.....	....
Other:								
Domestic [3]	118,334	9.17	1,879	9.08	116,455	9.17	.....	....
Imported	8,128	11.71	.....	....	8,128	11.71	.....	....
Slabs and mill waste	[1] 455,605	5.49	171,274	4.78	101,708	8.58	182,623	4.43

[1] See footnote 1, Table 2. [2] See footnote 2, Table 2. [3] See footnote 3, Table 3.

TABLE 5.—PULPWOOD CONSUMPTION, BY KIND OF WOOD, BY STATES: 1928

State	Number of establishments	Pulpwood Consumed (Cords)									
		Total	Spruce		Hemlock		Yellow pine, Southern	Poplar		Balsam fir	
			Domestic	Imported	Domestic	Imported		Domestic	Imported	Domestic	Imported
United States	204	[1] 7,160,100	2,000,433	1,063,348	1,158,958	18,677	925,698	225,194	199,871	257,379	102,287
Maine	25	1,309,988	845,837	135,374	55,561	3,681	.....	143,254	21,277	47,369	22,860
Wisconsin	33	1,225,630	233,151	156,047	522,721	9,307	.....	8,517	.....	130,627	6,424
New York	53	802,115	170,836	426,793	9,884	3,533	.....	9,025	102,136	11,078	46,816
Washington	12	651,657	43,208	455	211,105	2,156	.....	.....	.....	.....	.....
Louisiana	7	413,602	.....	.....	.....	.....	403,533	.....	.....	.....	.....
Pennsylvania	11	405,276	8,100	142,761	11,484	.....	50,404	.....	76,447	900	14,925
New Hampshire	8	351,349	274,670	60,469	.....	.....	.....	.....	.....	8,520	.....
Virginia	7	342,813	9,138	46,381	17,650	.....	198,115	.....	.....	.....	.....
Michigan	11	331,697	71,490	88,708	55,416	.....	.....	217	.....	38,190	11,262
Oregon and California	8	308,264	30,633	.....	207,023	.....	.....	.....	.....	.....	.....
Minnesota	6	282,691	198,086	.....	.....	.....	.....	31,431	.....	17,369	.....
Massachusetts	3	51,325	41,084	3,113	.....	.....	.....	7,117	11	.....	.....
Vermont	3	20,081	13,508	3,247	.....	.....	.....	.....	.....	3,326	.....
Other States [2]	17	663,612	60,692	.....	68,114	.....	273,646	25,633	.....	.....	.....

State	Pulpwood Consumed (Cords)									
	Jack pine	Yellow poplar	White fir	Beech, birch, and maple		Gum	Tamarack (larch)	Other		Slabs and mill waste
				Domestic	Imported			Domestic	Imported	
United States	[2] 175,957	122,738	105,161	65,227	17,100	72,611	67,394	118,334	8,128	[1] 455,605
Maine	.....	.....	.....	24,321	.....	.....	.....	3,769	389	6,296
Wisconsin	108,658	.....	.....	.....	.....	.....	48,758	217	.....	1,203
New York	100	.....	.....	414	17,100	.....	.....	.....	.....	4,400
Washington	.....	.....	37,563	.....	.....	.....	.....	32,365	7,739	317,066
Louisiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	10,069
Pennsylvania	.....	16,721	.....	31,170	.....	18,513	.....	62	.....	33,789
New Hampshire	.....	.....	.....	.....	.....	.....	.....	.....	.....	7,690
Virginia	.....	49,323	.....	3,169	.....	4,439	.....	.....	.....	14,598
Michigan	31,798	.....	.....	.....	.....	.....	18,266	.....	.....	16,350
Oregon and California	.....	.....	67,598	.....	.....	.....	.....	.....	.....	3,010
Minnesota	35,401	.....	.....	34	.....	.....	370	.....	.....	.....
Massachusetts	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vermont	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other States [3]	.....	56,694	.....	6,119	.....	49,659	.....	81,921	.....	41,134

[1] See footnote 1, Table 2. [2] See footnote 2, Table 2. [3] Arkansas, 1 establishment; Delaware, 1; District of Columbia, 1; Maryland, 2; Mississippi, 1; New Jersey, 1; North Carolina, 3; Ohio, 1; South Carolina, 1; Tennessee, 2; Texas, 1; West Virginia, 2.

TABLE 6.—PULPWOOD CONSUMPTION—QUANTITY AND AVERAGE COST PER CORD, BY CONDITION IN WHICH PURCHASED, BY STATES: 1928

State	Total		Rough		Peeled		Rossed	
	Quantity (cords)	Average cost per cord (f. o. b. mill)	Quantity (cords)	Average cost per cord (f. o. b. mill)	Quantity (cords)	Average cost per cord (f. o. b. mill)	Quantity (cords)	Average cost per cord (f. o. b. mill)
United States	[1] 7,160,100	$13.55	[1] 3,000,764	$11.19	3,750,929	$15.66	408,407	$11.58
Maine	1,309,988	17.25	219,170	15.48	1,054,506	17.50	36,312	20.81
Wisconsin	1,225,630	12.95	967,548	12.61	198,918	13.68	59,164	15.99
New York	802,115	18.65	71,973	17.32	647,407	18.72	82,735	19.33
Washington	651,657	7.34	296,432	7.68	173,416	9.85	181,809	4.17
Louisiana	413,602	5.87	319,831	5.86	93,771	5.91	.....	5.87
Pennsylvania	405,276	17.31	89,256	19.06	316,020	16.82	.....	....
New Hampshire	351,349	19.48	51,921	15.28	298,614	20.22	814	15.20
Virginia	342,813	11.50	109,120	6.76	233,693	13.71	.....	....
Michigan	331,697	13.97	238,058	13.47	93,639	15.26	.....	....
Oregon and California	308,264	10.04	166,133	10.16	95,711	8.49	46,420	12.78
Minnesota	282,691	11.90	265,895	11.55	16,796	17.52	.....	....
Massachusetts	51,325	18.98	.....	....	50,240	18.93	1,085	21.36
Vermont	20,081	16.47	6,169	13.13	13,844	17.92	68	23.00
Other States [2]	663,612	9.30	199,258	6.50	464,354	10.50	.....	....

[1] See footnote 1, Table 2.
[2] Arkansas, Delaware, District of Columbia, Maryland, Mississippi, New Jersey, North Carolina, Ohio, South Carolina, Tennessee, Texas and W. Virginia.

TABLE 2
PULPWOOD CONSUMPTION, BY KIND OF WOOD, FOR THE UNITED STATES: 1928, 1927, AND 1926

Kind of wood	Quantity (cords) 1928	1927	1926	Per cent distribution 1928	1927	1926
Total	[1] 7,160,100	6,750,935	6,766,007	100.0	100.0	100.0
Spruce:						
Domestic	2,000,433	2,077,893	2,415,870	27.9	30.8	35.7
Imported	1,063,348	948,216	1,013,155	14.9	14.0	15.0
Hemlock:						
Domestic	1,158,958	1,138,783	1,064,661	16.2	16.9	15.7
Imported	18,677	5,048	10,702	.3	.1	.2
Yellow pine, southern	925,698	755,175	684,816	12.9	11.2	10.1
Poplar:						
Domestic	225,194	220,268	212,178	3.1	3.3	3.1
Imported	199,871	186,695	210,133	2.8	2.8	3.1
Balsam fir:						
Domestic	257,379	305,143	254,614	3.6	4.5	3.8
Imported	102,287	84,087	42,500	1.4	1.2	.6
Jack pine	[2] 175,957	168,734	137,494	2.5	2.5	2.0
Yellow poplar	122,738	131,168	134,747	1.7	1.9	2.0
White fir	105,161	97,148	76,421	1.5	1.4	1.1
Beech, birch, and maple:						
Domestic	65,227	78,311	([3])	.9	1.2	..
Imported	17,100	.....	([3])	.2	..	..
Gum	72,611	64,314	49,801	1.0	1.0	.7
Tamarack (larch)	67,394	61,104	94,695	.9	.9	1.4
Other:						
Domestic	[4] 118,334	142,764	183,553	1.8	2.1	2.7
Imported	8,128					
Slabs and mill waste	[1] 455,605	286,084	180,667	6.4	4.2	2.7

[1] Includes data for a small quantity of spent licorice root of no market value.
[2] Includes data for a small quantity of imported Jack pine.
[3] Included in figure for "other."
[4] Comprises data for basswood, box elder, buckeye, cedar, chestnut, cottonwood, Douglas fir, white pine, and willow.

TABLE 3
PULPWOOD CONSUMPTION, BY KIND OF WOOD AND PROCESS OF MANUFACTURE, FOR THE UNITED STATES: 1928

Kind of Wood	Process of Manufacture (Quantity, Cords) Total	Mechanical	Sulphite	Soda	Sulphate	Semi-chemical
Total	[1] 7,160,100	1,558,818	3,196,939	928,300	1,435,252	40,791
Spruce:						
Domestic	2,000,433	870,008	1,070,491	6,020	53,914	.....
Imported	1,063,348	413,823	610,022	29,529	9,974	.....
Hemlock:						
Domestic	1,158,958	105,190	860,628	4,770	188,370	.....
Imported	18,677	3,695	14,982	.....	.....	.....
Yellow pine, southern	925,698	7,125	7,205	92,844	818,524	.....
Poplar:						
Domestic	225,194	21,934	13,087	190,058	115	.....
Imported	199,871	1	11	193,288	6,571	.....
Balsam fir:						
Domestic	257,379	56,949	137,810	.....	62,620	.....
Imported	102,287	27,094	67,880	.....	7,313	.....
Jack pine	[2] 175,957	9,553	20	100	151,339	14,945
Yellow poplar	122,738	53	.....	122,685	.....	.....
White fir	105,161	27,494	75,602	.....	2,065	.....
Beech, birch, and maple:						
Domestic	65,227	14	2,692	59,430	3,091	.....
Imported	17,100	.....	.....	17,100	.....	.....
Gum	72,611	.....	.....	70,422	.....	2,189
Tamarack (larch)	67,394	.....	327	.....	67,067	.....
Other:						
Domestic [3]	118,334	2,389	.....	115,728	217	.....
Imported	8,128	.....	.....	8,128	.....	.....
Slabs and mill waste	[1] 455,605	13,496	336,182	18,198	64,072	23,657

[1] See footnote 1, Table 2.
[2] See footnote 2, Table 2.
[3] Basswood, box elder, buckeye, cedar, chestnut, cottonwood, Douglas fir, white pine, and willow.

TABLE 8
WOOD PULP—PRODUCTION, BY QUANTITY AND PROCESS, FOR THE UNITED STATES: 1928, 1927, AND 1926

Process and condition	1928	1927	1926
Total	4,510,800	4,313,403	4,394,766
Mechanical	1,610,988	1,610,409	1,764,248
Not steamed	1,546,240	1,435,321	1,677,326
Steamed	64,748	175,088	86,922
Sulphite	1,558,858	1,552,699	1,558,175
Unbleached	836,751	872,411	911,729
Bleached	722,107	680,288	646,446
Sulphate	774,225	603,253	519,960
Unbleached	733,674	([1])	495,205
Bleached	40,551	([1])	24,755
Soda, unbleached and bleached [1]	488,641	487,478	496,920
Semichemical	29,967	11,983	([2])
Screenings	48,121	47,581	55,463
Mechanical	4,701	8,229	9,944
Chemical	43,420	39,352	45,519

[1] Not shown separately in order to avoid disclosing the production of individual establishments.
[2] Not reported.

TABLE 7
WOOD PULP—PRODUCTION, BY PROCESS, FOR THE UNITED STATES, FOR SPECIFIED YEARS: 1899 TO 1928

[Tons of 2,000 pounds]

Year	Total	Mechanical	Sulphite	Soda	Sulphate	Semi-chemical
1928	[1] 4,510,800	1,615,689	1,595,951	488,641	780,552	[2] 29,967
1927	[3] 4,313,403	1,618,638	1,588,132	487,478	607,172	[3] 11,983
1926	[4] 4,394,766	1,774,192	1,599,776	496,920	523,878	.....
1925	[5] 3,962,217	1,629,689	1,447,191	472,647	412,690	.....
1924	[6] 3,723,266	1,643,283	1,336,551	440,697	302,735	.....
1923	[7] 3,788,672	1,580,553	1,448,690	445,162	314,267	.....
1922	[6] 3,521,644	1,483,787	1,374,319	419,857	243,681	.....
1921	[6] 2,875,601	[8] 1,267,382	[6] 1,166,926	300,533	140,760	.....
1920	3,821,704	1,583,914	1,585,834	463.305	188,651	.....
1919	[9] 3,517,952	1,518,829	1,419,829	411,693	120,378	.....
1918	3,313,861	1,364,504	1,456,633	350,362	142,362	.....
1917	3,509,939	1,535,953	1,451,757	437,430	84,799	.....
1916	3,435,001	1,508,139	1,466,402	387,021	73,439	.....
1914	[9] 2,893,150	1,293,661	1,151,327	347,928	52,641	.....
1911	2,686,134	([10])	([10])	([10])	([10])	.....
1910	2,533,976	([10])	([10])	([10])	([10])	.....
1909	2,495,523	1,179,266	1,017,631	298,626	.....	.....
1908	2,118,947	([10])	([10])	([10])	([10])	.....
1907	2,547,879	([10])	([10])	([10])	([10])	.....
1904	1,921,768	968,976	756,022	196,770	.....	.....
1899	1,179,525	586,374	416,037	177,114	.....	.....

[1] Includes data for screenings, as follows: Mechanical, 4,701 tons; sulphite, 37,093; sulphate, 6,327.
[2] New classification.
[3] Includes data for screenings, as follows: Mechanical, 8,229 tons; sulphite, 35,433; sulphate, 3,919.
[4] Includes data for screenings, as follows: Mechanical, 9,944 tons; sulphite, 41,601; sulphate, 3,918.
[5] Includes data for screenings, as follows: Mechanical, 17,670 tons; sulphite, 44,105; sulphate, 2,922.
[6] Includes data for some screenings.
[7] Includes data for screenings, as follows: Mechanical, 12,759 tons; sulphite, 37,463; sulphate, 1,784.
[8] Includes data for screenings, as follows: Mechanical, 12,220 tons; chemical, not shown by process, 35,003.
[9] Includes data for screenings, as follows: Mechanical, 11,769 tons; chemical, not shown by process, 35,824.
[10] Not reported separately.

TABLE 10
PULPWOOD CONSUMPTION AND WOOD PULP PRODUCTION—NUMBER OF MILLS REPORTING, QUANTITY AND COST OF WOOD CONSUMED, AND QUANTITY OF PULP PRODUCED, BY STATES: 1928, 1927, AND 1926

State	Year	Number of mills reporting	Wood consumed: Quantity (cords)	Cost (f.o.b. mill): Total	Average per cord	Pulp produced (tons of 2,000 pounds)
United States	1928	204	[1] 7,160,100	$97,024,190	$13.55	4,510,800
	1927	219	6,750,935	95,452,365	14.29	4,313,403
	1926	224	6,766,007	101,229,402	14.96	4,394,766
Maine	1928	25	1,309,988	22,602,624	17.25	970,690
	1927	26	1,273,268	21,850,760	17.16	942,162
Wisconsin	1926	8	305,787	2,775,122	9.08	199,164
	1927	33	1,199,615	15,174,013	12.65	690,921
	1926	41	1,224,443	15,711,665	12.83	712,565
New York	1928	53	802,115	14,962,631	18.65	633,182
	1927	61	872,780	16,882,733	19.34	710,227
	1926	66	990,701	19,350,874	19.53	822,131
Washington	1928	12	651,657	4,781,566	7.34	349,107
	1927	13	445,664	3,588,506	8.05	268,349
	1926	8	305,787	2,775,122	9.09	199,164
Louisiana	1928	7	413,602	2,429,247	5.87	226,708
	1927	7	349,272	2,056,671	5.89	179,878
	1926	5	258,439	1,674,651	6.48	137,571
Pennsylvania	1928	11	405,276	7,016,656	17.31	218,598
	1927	12	398,021	7,171,606	18.02	216,587
	1926	13	425,684	7,171,764	16.85	233,258
New Hampshire	1928	8	351,349	6,843,713	19.48	198,587
	1927	7	358,376	6,958,956	19.42	200,324
	1926	8	431,138	8,969,404	20.80	248,600
Virginia	1928	7	342,813	3,942,477	11.50	189,925
	1927	8	316,032	3,775,393	11.95	170,630
	1926	6	317,058	4,032,829	12.72	163,506
Michigan	1928	11	331,697	4,634,972	13.97	196,203
	1927	12	351,688	4,712,584	13.40	193,539
	1926	12	331,570	5,136,117	15.49	200,604
Oregon and California	1928	8	308,264	3,094,255	10.04	213,407
	1927	7	267,235	2,764,536	10.34	200,869
	1926	7	232,989	2,655,507	11.40	178,841
Minnesota	1928	6	282,691	3,365,081	11.90	194,399
	1927	7	281,156	3,397,201	12.08	191,220
	1926	7	288,390	3,269,903	11.34	190,454
Massachusetts	1928	3	51,325	974,324	18.98	32,370
	1927	3	49,473	958,794	19.38	31,822
	1926	3	54,510	1,218,887	22.36	34,903
Vermont	1928	3	20,081	330,702	16.47	19,831
	1927	4	31,795	549,741	17.29	32,562
	1926	6	48,554	937,464	19.31	46,376
Other States	1928	[2] 17	663,612	6,176,561	9.31	347,012
	1927	19	556,560	5,610,871	10.08	284,313
	1926	16	558,387	5,705,842	10.22	281,003

[1] See footnote 1, Table 2.
[2] See footnote 3, Table 5.

TABLE 9
WOOD PULP—PRODUCTION, BY QUANTITY AND VALUE, BY STATES: 1928

State	Quantity (tons of 2,000 pounds)	Value	
		Total	Average per ton
United States	4,510,800	$206,490,469	[1] $45.78
Maine	970,690	39,487,603	40.68
Wisconsin	720,781	32,773,418	45.47
New York	633,182	28,146,895	44.45
Washington	349,107	11,974,544	34.30
Louisiana	226,708	7,836,044	34.56
Pennsylvania	218,598	15,322,022	70.09
Oregon and California	213,407	6,180,899	28.96
New Hampshire	198,587	16,949,662	85.35
Michigan	196,203	9,174,245	46.76
Minnesota	194,399	7,521,922	38.69
Virginia	189,925	10,225,453	53.84
Massachusetts	32,370	2,124,524	65.63
Vermont	19,831	628,585	31.70
Other States [2]	347,012	18,144,653	52.29

[1] Averages by process: Mechanical, not steamed, $27.20; steamed, $26.83. Sulphite, unbleached, $47.58; bleached, $76.94. Sulphate, unbleached, $41.93; bleached, $68.82. Soda, unbleached and bleached, $72.08. Semichemical, $44.10.
[2] See footnote 2, Table 6.

TABLE 11
IMPORTS AND EXPORTS OF PULPWOOD, BY QUANTITY, VALUE, AND CONDITION: 1928 AND 1927

Condition	1928			1927		
	Quantity (cords)	Total value	Average value per cord	Quantity (cords)	Total value	Average value per cord
Imports						
Pulpwood, total	1,546,338	$16,157,295	$10.45	1,596,787	$16,484,345	$10.32
Rough	515,078	5,080,534	9.86	431,251	4,239,933	9.83
Spruce	460,919	4,578,060	9.93	.....	.....	...
Other rough	54,159	502,474	9.28	.....	.....	...
Peeled	978,182	10,277,758	10.51	1,074,330	11,013,862	10.25

TABLE 11—Continued

Condition	1928			1927		
	Quantity (cords)	Total value	Average value per cord	Quantity (cords)	Total value	Average value per cord
Spruce	705,095	7,748,574	10.99	.....	.....	...
Other peeled	273,087	2,529,184	9.26	.....	.....	...
Rossed	53,078	799,003	15.05	91,206	1,230,550	13.49
Spruce	49,898	742,392	14.88	.....	.....	...
Other rossed	3,180	56,611	17.80	.....	.....	...
Exports						
Pulpwood, condition not specified, total	27,518	221,259	8.04	59,059	484,724	8.21

TABLE 12
IMPORTS AND EXPORTS OF WOOD PULP, BY QUANTITY, VALUE, AND PROCESS: 1928 AND 1927

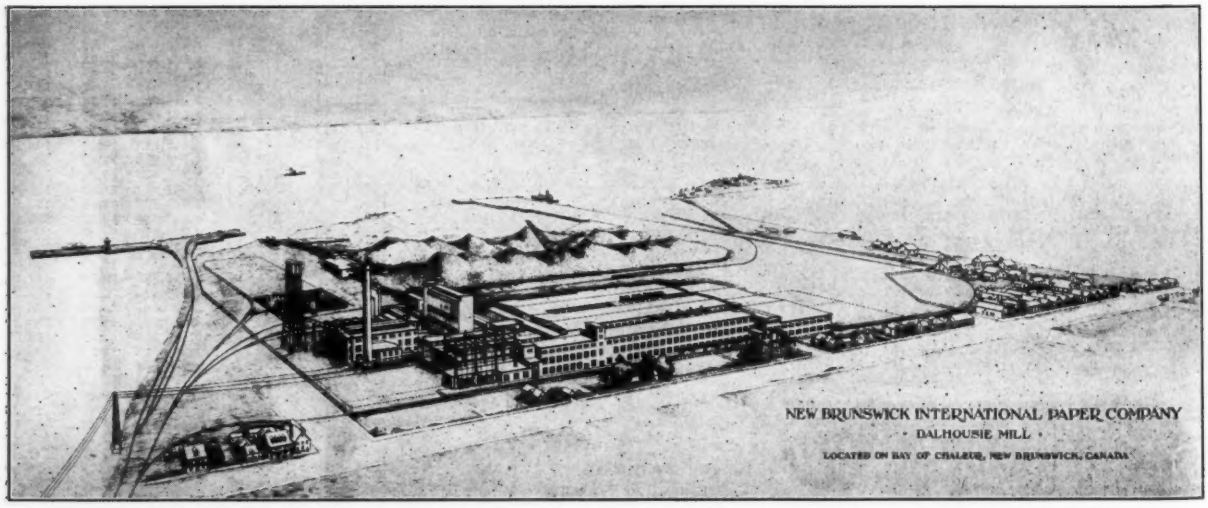
Kind	1928			1927		
	Quantity (tons, 2,000 pounds)	Total value	Average value per ton	Quantity (tons, 2,000 pounds)	Total value	Average value per ton
Imports						
Total	1,762,325	$83,819,778	$47.56	1,679,468	$86,086,270	$51.26
Sulphite, total	1,062,243	55,855,558	52.58	1,035,985	58,487,471	56.46
Unbleached	717,539	32,587,134	45.42	687,519	34,262,845	49.84
Bleached	344,704	23,268,424	67.50	348,466	24,224,626	69.52
Sulphate, total	443,348	22,065,535	49.77	394,134	21,393,010	54.28
Unbleached	427,007	21,170,948	49.58	382,050	20,684,298	54.14
Bleached	16,341	894,587	54.74	12,084	708,712	58.65
Ground wood	249,199	5,443,495	21.84	245,599	5,961,821	24.27
Other pulp	7,535	455,190	60.41	3,750	243,968	65.06
Exports						
Wood pulp, total	33,484	1,779,179	53.14	32,006	1,533,630	47.92
Sulphite	24,945	1,308,459	52.45	27,162	1,265,859	46.60
Soda	2,734	194,325	71.08	2,270	176,507	77.76
Other	5,805	276,395	47.61	2,574	91,264	35.46

REFORESTATION IN NEW YORK

Legislation to carry out the $20,000,000 reforestation program proposed by the Hewitt Reforestation Commission was introduced in the Legislature at Albany, N. Y., last week. Resolutions introduced by Senator Hewitt and Assemblyman Hutchinson propose a constitutional amendment which would permit the state to embark upon an eleven year program of reforestation on lands outside the forest preserve in the Adirondack and Catskill Mountains. If passed by the legislature the amendment will be submitted to the voters at the 1931 election.

Timber on the reforested lands outside the already established state preserves could be used for commercial purposes under terms of the proposal. At present, commercial and industrial interests are known to be irking under the inability to obtain as much lumber as necessary for requirements. There has been a suggestion also from the New York State Economic Congress that the section of the state constitution, which forbids timbering or any commercial activities within the state owned forest preserve, amounts to a waste of the state's natural resources.

The Hewitt reforestation program is intended eventually to afford a greater supply of timber for commercial purposes without invasion of the forest preserves which incidentally could only be accomplished by a modification of the existing provisions of the state constitution. Past efforts at this have failed. Under the proposal which went before the Legislature it is understood that $1,000,000 would be spent the first year for acquiring land for reforestation outside of the state preserves. For each of the next five years an additional $200,000 would be added to the annual appropriation.



PLANT OF THE NEW BRUNSWICK INTERNATIONAL PAPER CO. WHICH HAS JUST STARTED AT DALHOUSIE, N. B.

Big Dinners During Paper Week

Paper Manufacturers, Merchants and Salesmen and Technical Men Hold Banquets and Luncheons at New York Hotels.

Annual Banquet of American Paper and Pulp Association, Held for the First Time at the Hotel Pennsylvania, Attracts Close to 1,000 Members and Guests and Proves Highly Successful and Enjoyable Event—Interesting and Instructive Addresses by Leading Speakers Enlivened by a Plethora of Ready Wit and Humor—Judge Moore Makes Another Appearance and Is Vociferously Received by All of Those Present.

APPROXIMATELY one thousand members and guests of the American Paper and Pulp Association assembled at the Fifty-Third Annual Dinner in the grand ballroom of the Hotel Pennsylvania on Thursday night, this notable event winding up one of the most interesting and widely attended conventions in the history of the association.

Following the reception, the guests and members marched to the banqueting hall and located their tables. "The Star Spangled Banner" was played by the orchestra, after which the assemblage took their seats and proceeded to enjoy the excellent dinner provided.

The artistic menu and program contained the names and connections of the officers and executive committee of the association, the reception committee, the banquet committee and the past presidents from the beginning of the association. This beautiful menu was printed on Autumn Response furnished by the courtesy of the Keith Paper Company, of Turners Falls, Mass. The floral decorations for the tables were all of brilliant and many tinted hues of paper, provided by the Denison Manufacturing Company, of Framingham, Mass.

S. L. Willson, Toastmaster

S. L. Willson, president of the association was the toastmaster and seated with him at the speakers table were: A. B. Daniels, George W. Sisson, Jr., A. C. Hastings, George W. Gair, Charles Milton Newcomb, Harold Crabtree, Col. Willian J. Donovan, Dr. Nehemiah Boynton, Jesse H. Neal, D. C. Everest, K. S. Warner, Felix Pagenstecher, M. E. Marcuse, Judge Charles F. Moore and Walter J. Raybold.

The toastmaster introduced Harold Crabtree, president of the Canadian Pulp and Paper Association; K. S Warner, the newly elected president of the National Paper Trade Association; Jesse H. Neal, the recently appointed general manager of the American Paper and Pulp Association; and his old friend, Judge Charles F. Moore, all of whom were warmly received.

Judge Moore Speaks

Judge Moore, who was vociferously applauded, the whole audience rising to their feet, expressed his keen delight at being able to attend another banquet of the association. He told the gathering that he had made his first appearance at the annual banquet thirty-one years ago and stated that he had come back to make another farewell appearance. He made light of his infirmities and concluded by conveying his sincere wishes for the future welfare of the American Paper and Pulp Association and its members.

President Addresses Gathering

An exceptionally interesting address by President S. L. Willson, both in a serious and a humorous vein, followed. He said in part:

"For many years the members of our association, with their guests, have met at the Waldorf, and at these banquets have renewed old friendships and formed new ones.

"We are again gathered together, but in a new place, because our old stamping ground has succumbed to the march of progress, but I have seen no change in that spirit of good fellowship —so much in evidence in our old gathering place which developed through years of personal contacts, and the friendships thus formed have stood the test of time and have increased with the passing of the years.

"Associations were first formed in the days of Adam. Adam was created—but he had no associate. The necessity for association was recognized and under the divine plan an associate was duly provided through Torso Station R-I-B,—association work then started and began to be broadcasted. History has not recorded what the first association activities were (possibly because of the shortage of paper and secretaries at that time) but we are left with no uncertainty as to the results. Associations have since multiplied—until today we have an American Paper and Pulp Association, and others, in some of which we still find existing a bone of contention—not an heritage from Adam, because his rib was given without complaint and he contributed freely to the general cause.

"As members of an association we should contribute freely, willingly, and generously to its development. Results come only from co-operative effort, but co-operative effort is often unproductive because some necessary factor of cooperation is missing. It takes men, money, and materials combined to accomplish results.

"The greatest gift to mankind is the power to think; the next greatest is that of speech, and a third great gift is that of the written or printed word. The world marvels at the miracles of communication—the telephone, telegraph, and radio, but the written or printed word, while not so marvelous from a scientific standpoint, still remains the outstanding means for the dissemination of knowledge; for the further development of the arts and sciences, and the continued progress of mankind.

"These facts and the use of paper which have made these developments possible have resulted in the recognition of our industry as one of utmost importance and our commodity as vital to business as food is to mankind."

Col. W. J. Donovan Discusses Problems

In introducing Colonel William J. Donovan to the audience, the Toastmaster reviewed his brilliant record as Assistant Attorney General of the United States under President Coolidge. He is also well known as the Colonel during the World War, of the famous 69th Regiment of New York, which was mustered in as the 65th Regiment. He was awarded the Congressional Medal of Honor, the D. S. C., the D. S. M., the French Legion

PICTURE TAKEN AT THE FIFTY-THIRD ANNUAL BANQUET OF THE AMERICAN PAPER AND

AND ASSOCIATION AT THE PENNSYLVANIA HOTEL, NEW YORK, THURSDAY EVENING, FEBRUARY 20, 1930

of Honor, and the Croix de Guerre. At present he is a member of the law firm of Donovan & Raichle, New York.

Colonel Donovan, who was cheered again and again on rising, urged a rearrangement of the functions of the Federal Trade Commission to remove duplication of jurisdiction.

Certain hardships encountered by business which are attributed to the Sherman and Clayton acts, he said, would more properly be attributed to the fact that these acts are enforced in the courts by the Attorney General while the Federal Trade Commission, designed as a cooperative regulatory body for the business world, carried on its functions entirely unrelated to the anti-trust activities of the Attorney General. He recommended that all anti-trust work carried on by the Attorney General, except criminal actions, be taken before the commission rather than the Federal courts.

A Surprise Innovation

Following Colonel Donovan's address, the guests were surprised at the entrance of a brass band composed of beautifully attired girls, who marched around the ballroom playing Sousa's rousing marches, preceded by a fair maid with a tray of telegrams and letters, which was presented to the chairman.

The missives proved to be congratulatory messages from home and abroad and among the greetings read by Toastmaster Willson, were communications from the Finnish Paper Mills Association; The Paper Makers Association of Great Britain and Ireland; The Society of German Paper Manufacturers; The Norwegian Paper Makers Association; the Swedish Paper Makers Association; the Association for Cellulose, Paper Chemists and Engineers; The Manufacturers of Paper and Cardboard, France; The U. S. Chamber of Commerce, and R. ,P. Lamont, Secretary of Commerce.

Other Speakers

Other speakers at the banquet were Charles Milton Newcomb, of Cleveland, who gave a talk on "The Psychology of Laughter," a humorous scientific speech which was both entertaining and inspirational; and the Rev. Dr. Nehemiah Boynton, who is well known and respected by all paper men.

TECHNICAL ASSOCIATION LUNCHEON

The Technical Association of the Pulp and Paper Industry having decided to celebrate its fifteenth annual meeting with a luncheon, gathered about the festive board at the Pennsylvania Hotel, on Thursday. P. H. Glatfelter, president of TAPPI was chairman and proved an able toastmaster.

A delectable repast preceded the election of officers. Good cheer radiated as the meeting gave unqualified approval to the nominating committee's choice of candidates.

Such business attended to, chairs were pushed back and the climax of the gathering came in the attention compelling addresses by Otto Kress, H. K. Benson and Roderick Olzendan.

Otto Kress spoke on the work of the Institute of Paper Chemistry, outlining its objectives and explaining the wonderful start already made. So well did he portray the splendid work contemplated that anonymous, but most welcome, gifts were made from the audience.

Roderick Olzendan, formerly a paper man, and now director of the Industrial Division, Policy Holders Service Bureau, of the Metropolitan Life Insurance Company, spoke on "Human Engineering at Home and Abroad." He gave a most stirring address and undoubtedly left a message which will bear good fruit in the papermaking industry.

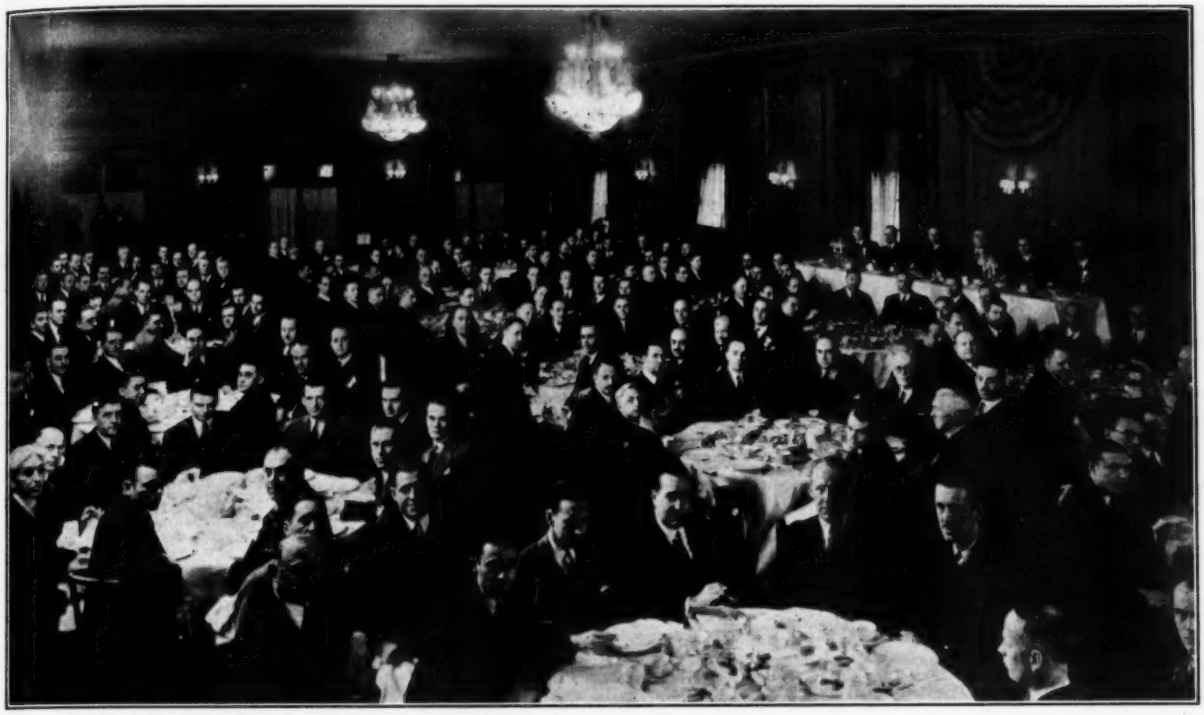
The final two papers were of a technical nature, well received and most pertinent.

NATIONAL PAPER TRADE CELEBRATES

Winding up one of the most successful conventions ever held by the National Paper Trade Association, the organization staged a theatre party and supper dance on Wednesday evening. The change in the form of entertainment met with unanimous approval and there was an enthusiastic and exceptionally large attendance of members and guests.

The theatre party was held at the Imperial Theatre, where one of the outstanding musical successes of the season is being presented and everyone present thoroughly enjoyed the magnificent performance of "Sons O'Guns." The work of Jack

BANQUET OF THE TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, HOTEL PENNSYLVANIA



BANQUET OF THE SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, HOTEL PENNSYLVANIA

Donahue, Lila Damita, Shirley Vernon, William Frawley, Mary Horan, David Hutcheson, Joseph Spree and the Albertina Rasch Girls, was particularly appreciated.

Following the theatre, the gathering adjourned to the Hotel Astor, where an enjoyable supper was provided. To the strains of an excellent orchestra dancing was enjoyed until the early hours of the morning. Opinions were heard on all sides that this was the most successful and enjoyable affair ever held by the association and congratulations are due especially to the hard working committee.

PAPER SALESMEN'S LUNCHEON

There was an excellent attendance at the annual luncheon of the Salesmen's Association of the Paper Industry, held on Tuesday afternoon at the Hotel Pennsylvania, New York. The affair proved one of the most successful and enjoyable events ever arranged by the association.

During the luncheon the proceedings were enlivened by popular musical selections rendered by an excellent little orchestra, to the strains of which one and all sang lustily and in unison. Cheer-Up song sheets were provided by T. Arthur Baker, the well known theatrical and concert agent.

S. C. Knode, of the Albemarle Paper Company, president of of the association, occupied the chair, and after a few well chosen remarks, introduced the speaker, William M. Kiplinger, head of the Kiplinger Washington Agency.

Mr. Kiplinger, who is thoroughly competent to discuss Washington affairs from the point of view of the business world, made an interesting and instructive address. He said he had been raised near a paper mill and spoke of his knowledge of the paper industry and of paper salesmanship.

The Tariff Bill was discussed in a comprehensive manner by the speaker, who predicted that it would probably be passed some time in April. He also reviewed the growth of radicalism in the country, following a long period of conservatism, and expressed the opinion that two years from now the West would have more influence with Congress than the industrial East.

Mr. Kiplinger also discussed over-production, price cutting, and price discrimination, and declared that the Federal Trade Commission was at present investigating these conditions. He did not believe that Washington would take steps to obviate these evils for four or five years and said that the greatest hope lay in the work of Trade Practice Conferences arranged by Trade Associations and Trade Groups for the purpose of stamping out unfair trade practices.

COST ASSOCIATION LUNCHEON

The annual luncheon of the Cost Association of the Paper Industry attracted a large and enthusiastic gathering of members and guests on Wednesday afternoon at the Hotel Pennsylvania. Colonel B. A. Franklin, vice-president of the Strathmore Paper Company, of Mittineague, Mass., was an efficient chairman and introduced the speakers with a few timely remarks in his usual humorous vein.

Dr. E. O. Merchant, statistician of the G. H. Mead Company, New York, gave an interesting address on "The Outlook for General Business and the Pulp and Paper Industry in 1930." After discussing the general business outlook and the outlook for the building and automobile industries in particular, Dr. Merchant declared that for the first half of 1930, the consumption of all grades of paper combined is likely to show some loss as compared with the first half of 1929. He said further:

"For the third quarter consumption should be about equal to that of a year ago, while for the fourth quarter it seems pretty certain that gains will be in evidence and in some cases they will probably be large enough to offset the losses of the first half year. In other words, taking the year 1930 as a whole, the total consumption of all grades of paper combined will not vary much from the 1929 figure of about 13,000,000 tons. In the case of some grades, consumption may show a little increase and in other cases a small decrease.

"Only a comparatively few paper concerns have successfully solved their distribution problems. A fundamental difficulty is that most mills are dominated by production-minded instead of sales-minded executives. As a result, production continues to be in ex-

cess of market requirements and selling below cost is widely prevalent. From now on, if progress is to be made, attention must be focussed upon distribution rather than manufacturing problems. Sales and cost departments must be given a greater voice in the management and the individual concerns in each branch of the industry must co-operate more fully with one another through their trade associations in the solution of their common problems."

A. W. Ramsdell, of Batten, Barton, Durstine & Osborne, Inc., advertising agents, New York, chose for his subject "Putting Profit Into Paper." He said that on threshold of 1930, the American manufacturer finds himself in a most unusual position, and one not liable to immediate change. In a period of unprecedented national prosperity, the cost of maintaining adequate sales volume to take care of factory production which modern scientific methods have made possible, has absorbed such a large proportion of the difference between the cost and selling price, that the manufacturer is being forced to study distribution methods and markets as carefully and as scientifically as he formerly studied production methods and costs.

Mr. Ramsdell concluded by declaring that in the United States today, with our ability to produce, outstripping our ability to consume, the manufacturer who does not sell at a profit will sooner or later join his brethren who played Santa Claus, in the business graveyard. "Set a standard for your product," he declared. "Set a price. Tell the consumer your standard and your price, and don't lower either one. It can be done."

PAPER STOCK DEALERS DINNER

The twenty-second annual dinner of the New York Association of Dealers in Paper Mill Supplies, Inc., was held Tuesday evening, February 18, in the East Ballroom of the Hotel Commodore.

The two hundred members and guests enjoyed a most excellent repast and an interesting musical entertainment.

Tables were reserved by Sol Ash, Inc.; Atterbury Brothers.; D. Benedetto, Inc.; C. F. Bradley; Brooklyn Paper Stock Company; Cantasano Brothers; J. H. Carlo & Co.; Economy Baler Company; S. J. Fisher, Inc.; Gaccione Bros. & Co.; Giove, D'Arecca & Co.; Daniel M. Hicks, Inc.; Gus A. Johnson, Inc.; E. J. Keller & Company; Leshner Paper Stock Company; D. Manzolillo & Son; Ernst Mayer, Inc.; Geo. W. Millar & Co., Inc.; A. J. Moran & Co., Inc.; W. Steck & Co.; Sterling Mill Supply Company and the Whaling Waste Products Company.

Considerable credit must be given to the officers and committees of the association for their diligent efforts in the conduct of the banquet.

BINDERS BOARD LUNCHEON

The annual meeting and luncheon of the Binders Board Manufacturers Association was held at the Hotel Pennsylvania on Thursday afternoon. The following officers were elected:

President, J. P. O'Brien, Otter River Board Company, Otter River, Mass.

Vice-President, William Foulds, Jr., Colonial Board Company, Manchester, Conn.

Treasurer, A. B. Goodrich, Riverside Mills, Glastenbury, Mass.

Secretary, O. M. Porter, New York.

Executive Committee, Edward Kerr, The Davey Company, Downingtown, Pa., and B. O. Trubee, Fandango Mills, Milburn, N. J.

WASTE UTILIZATION LUNCHEON

The National Committee on Waste Utilization and Stream Improvement held a meeting following their annual luncheon on Tuesday, February 18, at the Hotel Pennsylvania. There was a period of general discussion with each member of the eighteen in attendance offering constructive suggestions. The comments were on the subject of operating methods and programs to be carried out in the coming year. The work will go forward as outlined:

1. The Association should underwrite and make available the necessary funds for continuation of the work.

2. Contributing non-member mills shall be extended the same privileges as members of the association in this particular work.

3. Mill service to the extent of preliminary surveys to individual mills should be continued without charge.

4. Extension of the service beyond preliminary surveys should be encouraged and provided, and a charge made to cover the Engineer's salary and expenses.

BANQUET OF THE NEW YORK ASSOCIATION IN PAPER MILL SUPPLIES, COMMODORE HOTEL

5. Service to non-member, non-contributing mills, might be extended as conditions permit, with a charge of actual expenses plus two times the regular salary of the Engineer.

George K. Spence outlined the activities of the subcommittee on sulphite waste paper. S. B. Copeland reported upon the organization and program of the committee of the Pulp and Paper Industry in Maine on stream pollution surveys. H. K. Benson reported upon paper and pulp mill pollution on the Pacific Coast. W. G. MacNaughton brought out some special problems in the news print industry. C. P. Winslow, of the Forest Products Laboratory, reported on the work now being done in the utilization of sulphite waste liquor.

GLAZED AND FANCY LUNCHEON

A meeting and luncheon of the Glazed and Fancy Paper Manufacturers Association took place on Tuesday, at the Pennsylvania Hotel, and at this time many subjects of vital interest to the association were taken up by various members. A dinner for the executive committee of this same group was held the previous evening.

At the annual meeting the following officers were elected for the ensuing year:

President, John G. VanHorn, Holyoke Card and Paper Company, Springfield, Mass.; Vice-President, John McLaurin, McLaurin-Jones Company, Ware, Mass.; Secretary-Treasurer, L. I. Houghton, Springfield, Mass.; **Executive Committee, John G. VanHorn, chairman;** John McLaurin, I. O. Van Duzer, Louis DeJonge & Co., New York; R. N. Fowler, Hampden Glazed Card and Paper Company, Holyoke, Mass.; A. S. Guggenheim, United Manufacturing Company, New York.

WOODLANDS SECTION LUNCHEON

At the close of the morning business session on Wednesday, February 19, the Woodlands Section adjourned for lunch which was held in the mezzanine ballroom of the Pennsylvania Hotel. During the serving of the lunch G. M. Ostrander, chairman of the Woodlands Section, called on several for impromptu remarks, among those responding being J. D. Gilmour, of the Canadian Woodlands Section, of Montreal, Canada, and A. W. Koreleff, secretary of the Canadian Woodlands Section. Both expressed pleasure at the opportunity of meeting the members of the Woodlands Section and discussing problems which similarly confronted the Canadian industry as well as that of the United States.

H. B. Shepard, of the United States Forestry Service, talked on the hazards attending the ownership and development of timberlands, stating that the higher the hazard risks, the higher must be the returns on the investment. He spoke at length on the work being carried on by the United States Forest Service Bureau and the results already accomplished by educational efforts.

Jesse H. Neal, general manager of the American Paper and Pulp Association, speaking from the viewpoint of an outsider, expressed surprise at the small sum invested by our industries in the development and protection of their basic raw material. He visualized the possibility of development of what are now waste lands by subsidizing owners of same over a period of years whereby they would receive immediate returns from reforestation of what is now waste acreage.

ADVERTISING CLUB LUNCHEON

Many matters of interest to the Paper Makers Advertising Club were covered by informal talks at the luncheon of the members, mainly stressing the most productive technique of advertising in the paper industry. The luncheon took place at the Hotel Pennsylvania on Wednesday.

STANDARDIZATION LUNCHEON

The Committee on Simplification and Standardization of Printing Papers held an enjoyable luncheon in Parlor C of the Pennsylvania Hotel in New York City, on Monday, February 17. Problems of interest to this group, and the satisfactory solutions of such problems, were discussed.

WAXED PAPER LUNCHEON

The members of the American Waxed Paper Association gathered in the balcony Foyer of the Hotel Pennsylvania on Tuesday for their annual luncheon, at which many matters of intense interest to the development of the waxed paper industry were profitably gone over.

GUMMED INDUSTRIES LUNCHEON

There was a large attendance at the luncheon of the Gummed Industries Association on Wednesday at the Pennsylvania Hotel. Various matters of vital interest to this group were thoroughly discussed at this time, and the entire group agreed that it was a very successful and instructive meeting.

SULPHITE PAPER LUNCHEON

The luncheon of the National Sulphite Paper Manufacturers Association on Tuesday, at the Hotel Pennsylvania, was very well attended, and the exchange of ideas on the manufacture of sulphite paper was most instructive.

MEAD COMPANIES PROPOSE MERGER

According to a press dispatch formation of a $30,000,000 corporation, to be called the Mead Corporation, for the purpose of acquiring the assets of the present Mead Pulp and Paper Company of Chillicothe, Ohio, the Mead Paper Board Corporation and the Management, Engineering and Development Company has been recommended to the stockholders of the companies by their respective directors.

The $30,000,000 corporation would be financed through authorization of 500,000 shares of no par preferred stock and 1,000,000 shares of no par common stock. Of the preferred, 38,250 shares would be known as $6 cumulative Series A. The companies to be acquired would receive 435,000 shares of the new common stock.

Application to list both stocks of the new company on the New York Stock Exchange would be made.

The merger, if carried out, would facilitate, it is said, the operations of the companies concerned and particularly those of the Mead Pulp and Paper Company, which has grown from a $300,000 corporation to one with more than $10,000,000 capitalization. Greater diversity of products also would be made possible.

The proposed basis for exchanges of stocks for effecting the merger is as follows:

One and one-fifth share of series A preferred stock of the new company for each share of 6 per cent preferred share of the Mead Pulp and Paper Company; one and one-sixth share of series A preferred for each share of 7 per cent preferred stock of Mead Pulp and Paper; two shares of common for each common share of Mead Pulp and Paper; two and one-half shares of common for each 7 per cent preferred share of the Mead Paper Board Corporation; one share of common for each common share of Mead Paper Board, and one share of common for each share of the Management, Engineering and Development Company. Scrip certificates would be issued for fractional shares and would not bear dividends.

The directors indicate that dividends on the common stock of the Mead Corporation should be maintained at a rate equal to that on the common stock of the Mead Pulp and Paper Company, which is $4 a year.

MANUFACTURERS OF PAPER MEET

American Paper and Pulp Association Holds Fifty-Third Annual Convention at the Pennsylvania Hotel, New York City

S. L. Willson, President of the American Writing Paper Co., Holyoke, Mass., Is Re-elected President—Jesse H. Neal, Recently Appointed General Manager of the Association Presents Comprehnsive Plan for Establishment of a National Paper Council To Represent the Affiliated Associations in Directing the Organization Which Will Retain Its Present Nature—Charles W. Boyce Is Made Secretary of the Association.

GREAT interest was manifested in the fifty-third annual meeting of the American Paper and Pulp Association, which will probably go down as one of the most important meetings in the history of the organization. President S. L. Willson called the meeting to order at 10:00 A.M. The minutes of the fifty-second annual meeting were approved without reading.

In his annual address, President Willson declared that some of the weak spots in the association were brought to attention through a proposed plan for reorganization under which plan a competent official would be installed who would have that constant and personal contact with the association's affairs that a president of any corporation should and must have to successfully manage it.

The plan submitted through the reorganization committee was referred back to the incoming president and executive committee for such action as in their judgment seemed expedient, and it was given their further consideration. The president was instructed to seek a contact man to manage the association's affairs in a larger capacity than that of secretary, and a man whose past experience, prestige and ability could be usefully applied to their problems. Several men very prominent in public life were approached and conferences held with them without success. "Your president at first either proved too good a salesman by picturing the wonderful opportunities for 'work to be done' and the necessity for its being done, declared Mr. Willson, "or he failed to make plain the great opportunity for such a man increasing his prestige through his accomplishments for the paper industry."

The association finally found the man whose past experience and ability seemed to particularly qualify him to assume to management and to create, develop, and apply remedies for some of the problems, and the executive committee authorized his appointment as general manager. In order to make this appointment possible, the members of the executive committee underwrote the necessary funds, pending further development of other phases of the reorganization plan, and in order that some of the proposed changes could be initiated.

S. L. WILLSON, PRESIDENT

"Our plan appears equitable and practical—though not yet perfected—and our new general manager I believe can work it out, providing he has the proper support," stated Mr. Willson. "The principles and some of the details of the plan will be presented later by Mr. Neal, and I hope it will receive your approval. In inaugurating it, I want to impress you with the fact that it must necessarily be carried out gradually, and that it will be subject to modifications from time to time to meet changing conditions. Our plans today are the blue prints—without the detailed and final specifications. The architect has done his work—and we have the builder. We now need the materials, money, and time to complete it, and especially your confidence."

President Willson stated that he had been impressed during the past year with the inadequacies of the parent association to effectively carry out the objects for which it was created. Small organizations can be operated and become useful with a small force and limited resources, but to attempt to handle an organization that has grown many times as large with the same force and the same resources —a condition of lost energy and of no practical utility is created. That is the situation today. The Industry has leaped ahead, while the association activities have been so divided, so restricted, and so limited in resources that its present value to its members has been greatly curtailed. Because of the great variety and uses of paper, group associations have been brought into existence to promote the interest of their members. They are necessary and will continue to function for good, but some of them lose sight of the fact that other branches are equally important or perhaps more important than their particular group, and that industry problems should be handled through the association that represents the entire industry.

Past administrations have been, the same as the present administration, handicapped by divided efforts and practically helpless because of the mushroom growth of the in-

dustry. It is not reasonable to expect that an ideal organization can be built up hurriedly, declared the speaker. It will require time and will have to be done gradually. The new plan contemplates no radical changes. The personnel, even with the new general manager, has not been increased, and no money will be wasted in wild schemes.

After a general review of work completed during the past year by the various divisions of the American Paper and Pulp Association, Jesse H. Neal, general manager, presented a plan for reorganization. Mr. Neal offered a comprehensive plan for the establishment of a National Paper Council to represent the various affiliated group associations in directing the activities of the organization, which will retain its present nature.

This Council is to consist of one representative from each affiliated association, and it will in effect determine the program of the association's activities with the supervision of the executive committee.

An amendment to the constitution of the association was voted to embrace whatever changes are necessary for the adoption of this new plan. This amendment will take effect beginning April first, and it will include voting powers in proportion to the amount of business done by the various member companies.

In addition to the new plan, Mr. Neal emphasized the importance of promoting export business by the American paper industry. A proposal was also made by Mr. Neal to take over the Cost Association as a direct branch of the American Paper and Pulp Association.

At the afternoon session several interesting and instructive addresses were presented by leading figures in the paper industry, including Ernst Mahler, of the Kimberly-Clark Corporation, who discussed "The Institute of Paper Chemistry;" D. C. Everest, of the Marathon Paper Mills Company, who spoke on "Regional Shifts in Paper Production;" George H. Mead, of the Mead Pulp and Paper Company, who described "Sales Policies," and Adam Wilkinson, of the American Writing Paper Company, who demonstrated "A Working Alliance Between Labor and Capital."

Formal announcement was made by the executive committee to the effect that Jesse H. Neal, the new general manager, would also be treasurer of the association, while Charles W. Boyce, who for several months has been acting secretary, was made secretary of the association, to assist Mr. Neal in the direction of the association's activities.

The following officers were re-elected for the forthcoming year. President, S. L. Willson, American Writing Paper Company, Holyoke, Mass.; Vive-President, M. E. Marcuse, Bedford Paper Company, Richmond, Pa.; Executive Committee: S. L. Willson, M. E. Marcuse, Hugh Chisholm, Oxford Paper Company, New York City; A. R. Graustein, International Paper Company, New York City; D. C. Everest, Marathon Paper Mills Company, Rothschild, Wis.; C. B. Morgan, S. D. Warren Company, Boston, Mass.; Norman W. Wilson, Hammermill Paper Company, Erie, Penn.; George W. Gair, Robert Gair Company, New York City.

ADDRESS OF THE PRESIDENT

S. L. Willson, president of the association, delivered his annual address as follows:—

Fifty-two years ago, the first annual report of a president of this association was presented, and from year to year, similar annual reports have been made. It is to be expected that such a practice will be continued in order that a general summary of the year's operations shall be given to the members of the association.

I can now well imagine the reluctance of many of my predecessors to accept the honor of becoming the association's president, first, because of their other important and individual business obligations which preclude their devoting the necessary time for association affairs, and second, because they were types of business men who believed in doing well what they attempted to do, which, as far as their association obligations were concerned, was practically impossible, owing to existing conditions and the new ones constantly developing that required the services of a specialist. The same conditions have prevailed during the past year, but some effort and some progress has been made to improve them.

At our last annual meeting, some of the weak spots in our association were brought to your attention through a proposed plan for reorganization, under which plan a competent official, call him general manager or by another title if you wish, would be installed and who would have that constant and personal contact with the association's affairs that a president of any corporation should and must have to successfully manage it. The plan submitted through the reorganization committee was referred back to the incoming president and executive committee for such action as in their judgment seemed expedient, and it was given their further consideration. Your president was instructed to seek a contact man to manage our association's affairs in a larger capacity than that of secretary, and a man whose past experience, prestige and ability, could be usefully applied to our problems. Several men very prominent in public life were approached and conferences held with them without success. Your president at first either proved too good a salesman by picturing the wonderful opportunities for "work to be done" and the "necessity for its being done," or he failed to make plain the great opportunity for such a man increasing his prestige through his accomplishments for the paper industry. But we continued our efforts, and finally found the man whose past experience and ability seemed to particularly qualify him to assume to management and to create, develop, and apply remedies for some of our problems, and your Executive Committee authorized his appointment as general manager. Notice of Mr. Neal's appointment and installation was duly forwarded to you at the time, with a resume of his past accomplishments. In order to make this appointment possible, the members of your executive committee underwrote the necessary funds, pending further development of other phases of the reorganization plan, and in order that some of the proposed changes could be initiated. I shall not attempt to sell you the idea that a panacea has been found either in the man or in the plan, and if I were sure that we had both the right man and the perfect plan, I would not have you think our troubles are at an end; but our plan appears equitable and practical, though not yet perfected, and our new general manager I believe can work it out, providing he has the proper support.

The principles and some of the details of the plan will be presented to you later by Mr. Neal, and I hope it will receive your approval. In inaugurating it, I want to impress you with the fact that it must necessarily be carried out gradually, and that it will be subject to modifications from time to time to meet changing conditions. Our plans today are the blue prints, without the detailed and final specifications. The architect has done his work, and we have the builder. We now need the materials, money, and time to complete it, and especially your confidence.

The ancient philosopher, Socrates, had nothing on the president of your association when he said "I know that I know nothing"—but with the balance of that quotation I do not agree, because he also added—"and the rest know not even this."

My inability to contact with so many of our association activities warrants my applying and personally using the first part of his quotation, but there are others in our organization whom I would defend against any effort to have applied to them the concluding clause. We have group memberships headed by men who do know their problems. We have affiliated associations headed by men who also know their problems. We have numerous committees covering many and varied activities of our industry composed of able men who have secured efficient results through their contacts and through the study of their problems, and who have demonstrated their knowledge of them, so I shall depend upon their personal reports to you and only incorporate in my report those matters which I either profess to know, or to express some ideas which have occurred to me for future consideration.

Has not each one of us thought too much of our individual businesses, and have we not lost sight of the collective industry

problems, in which we should be interested? We find, because of the great variety and uses of paper, that group associations have been brought into existence to promote the interest of their members. I heartily endorse their existence, and the work of those groups. I believe they are necessary and will continue to function for good, but some of them, I fear, lose sight of the fact that other branches are equally important or perhaps more important than their particular group, and that industry problems should be handled through the association that represents the entire industry. The absence of association support and cooperation is very conspicuous. I believe the association, with proper support, can be and will be made more useful and more helpful to its members than in the past. There are branches of the industry that have not even formed Group Associations. These should be formed for the same lawful ends for which the others have been formed. There are also too many independent associations and committees that are attempting to function for the entire industry that should be handled at the industry headquarters. There is irritation on the part of some members because they are asked to contribute first to the association, and then to one or more separate activities. They do it liberally in many cases, yet some of those separate activities cover industry problems and should be financed by the association through the support of the entire membership, instead of being supported by a limited number. There is too much duplication of effort and this is expensive to our members. I am not criticising past administrations. They have been, the same as the present administration, handicapped by divided efforts and practically helpless because of the mushroom growth of our industry.

Let us, for example, consider the various special associations and committees—

The Tariff Committe certainly represents the entire Industry, yet its activities were and are supported by a limited number, and to a financial extent, greater than the total income received for carrying on our entire association activities.

The Cost Association is separate and mostly supported by the voluntary contributions of a few members, yet it handles industry problems.

Special Legislation Committees supported by voluntary subscriptions from a limited number.

Technical Association, useful to the entire Industry, yet supported separately.

Superintendents' Association, covering all grades made, also separately supported.

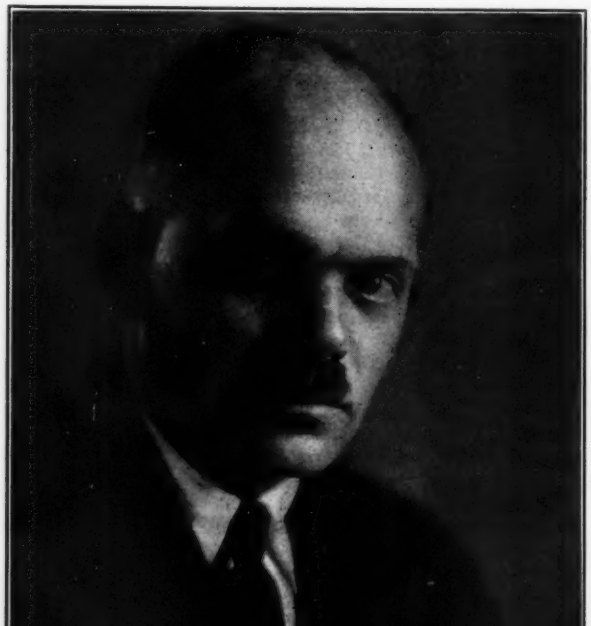
White Waste Utilization, with a dual support, and I could enumerate others.

I am pointing out these matters to indicate the difficulties my predecessors have faced, resulting simply from over-growth of the industry, and lack of the necessary financial support of the parent organization.

It is not reasonable to expect that an ideal organization can be built up hurriedly. It will require time and will have to be done gradually. The new plan contemplates no radical changes. The personnel, even with the new general manager, has not been increased, and I assure you no money will be wasted in wild schemes. We intend to have something real in the way of results, to show later if you will have confidence in the association and properly back it. We do not expect to put any unusual burden on you financially, but we must have necessary working capital, and we expect to secure this through dues established on an equitable basis.

Savings in Concentration

The paper industry is an important one, and it is a peculiar one, and should be carefully nursed and provided for. We turn our working capital about once in fifteen months—or 75 per cent of it is turned over in a year. If we had accurate data, and could marshal and interpret the true conditions for you, I am sure a decided improvement in our industry would soon follow. A great saving, and a more equitable distribution of cost could be effected if we concentrated a number of the activities within the parent organization, and we would have a better knowledge of real



CHARLES W. BOYCE, SECRETARY

JESSE H. NEAL, GENERAL MANAGER

conditions, and could devise effective methods for improving them. A bad condition will continue to be bad and even grow worse until somebody begins to complain about it. For a number of years there have been rumblings of discontent from some of our members, because no tangible benefits have been derived from membership. I am deliberately stirring up this matter because I want you to think about it, not only here, but when you return home. Don't forget your own problems, but the more you think of them, if properly analysed, the more apt you are to conclude that the association can be of value to you in solving them, but I want to add that it can help you only to the extent that you support it and use it.

Forestry Problem

Many of us give little or no thought to the forestry problem, yet it is one of our vital problems. Did you ever stop to think that 90 per cent of our product has wood for its base? Have you ever stopped to consider that every group in our industry is linked together on the problem of raw material, and each and every group is tied in and will be immeasurably affected by the depletion of our forests? Much additional work should be done in securing useful data on regional supplies; the utility of grades, heretofore believed to be unsuitable for your paper making purposes, and reforestation.

Waste Utilization and Stream Improvement

I have been quite impressed with the splendid results shown through Mr. Baker's report of the work of the committee on waste utilization and stream improvement, and with the possibilities of large savings to those who avail themselves of the service. The value of this service has been demonstrated and its use will result in real savings.

Arbitration in the Paper Industry

In these days of peaceful settlement of controversies, we are provided the means through arbitration to settle many disputes upon a basis of equity, rather than by litigation. An agreement to arbitrate is the sane, practical, and economic method of settling disputes, and I recommend that a uniform arbitration clause be adopted and printed in our contracts. A conference committee should be established for this purpose.

Five Day Week

Discussions regarding the five day week are prevalent. The basis for this agitation is over-equipment and over-production of some grades of paper and boards. This is a problem that will require much thought. In my opinion it will be very difficult to adopt it for the entire industry under present conditions, but it is not beyond the bounds of possibility that certain groups could practically apply it. Further comment on this subject will be given later by Mr. Wilkinson, who will discuss labor problems.

Export of Paper

I believe our industry has been derelict in not taking advantage of the opportunities that exist to export more paper and thereby secure some relief for the over-capacity in the industry. Our association proposes to take the initiative in starting some activities that will make known what we have to sell. Other industries have been securing results through promotional work, and we can also. Whatever is done will be for the benefit of all members alike, and done in a way that will prevent any preferential treatment.

Research Work

We shall hear today regarding a new departure in research work in paper chemistry, which I wish to commend to you. Like other activities, this has been neglected in the past. The mysteries of the world are being gradually unfolded through scientific research. Considerable progress by individual mills has been made, but no concentrated effort in the industry has ever been instituted until the present time. Mr. Ernst Mahler will tell you of this later.

Without intimate knowledge of the activities of the various committees functioning during the past year, except through their reports, I have avoided repetition by relying upon the chairman of each committee to submit his report to you.

In closing I wish to express my appreciation to the executive committee, Mr. Neal, Mr. Boyce and others in the association's headquarters for their splendid support and assistance to me during the past year.

I believe we have before us another year of prosperity. The depression felt during the past two months I believe is about over. The mental attitude is less of fear and more of hope, which comes from the recent demonstration and proof of the soundness of our institution and our country's ability to cope with almost any condition that can arise.

REPORT OF THE SECRETARY

Jesse H. Neal, the recently appointed general manager of the association presented the following foreword to the secretaries' report:—

Having been with the organization but a few days over three months, the writer believes it fitting that the report of our activities during the past year, should be made by those who assumed the responsibilities and achieved the results. A just appraisal of the year's progress, will disclose more than a proportionate return to the industry for the amount invested. Every one of the department heads and each employee displayed a loyal, intelligent interest in the work and gave unsparingly of their best efforts, oftentimes in disregard of personal convenience or the regular working hours. The pleasure of working with such a staff is second only to the pride which should inspire any man given the opportunity of playing some part in promoting the welfare of an industry such as ours.

Charles W. Boyce, who for the past several months has been acting secretary presented the following report:—

The commanding advance of the American paper industry, culminating in 1929, has placed the industry in a new and enviable position in the economic structure of the nation. More firmly entrenched than ever before among America's great supplying industries, the manufacture of paper contributes to the advance of civilization a product that is essential to social and commercial intercourse. Upon the industry rest, therefore, responsibilities that cannot be taken lightly. Significant among them is its own prosperity, for unprofitable industry cannot meet its responsibilities.

That the American Paper Industry can meet its responsibilities both to the nation and to its stockholders is undeniable; yet the experience of the past few years would seem to indicate the contrary. It is true that the flow of paper from the mills to the markets has been uninterrupted and regular; surely none have lacked sufficient paper. But it is not equally true that the flow of returns from the market back to the mill has been adequate; undeniably, profits have been low.

American paper consumption increased over a half million tons in 1929 and production increased nearly as much, but the percentage of idle machine capacity in the industry remained at a quarter of the total. With so large a percentage of idle capacity, the temptation to overproduce is great. And many producers did. The inevitable resulted. When supply exceeds demand healthy competition is replaced by a destructive variety in which price slashing, order buying, and wholesale disregard of market requirements spread as a ripple upon a lake throughout the whole industry; for the industry is cohesive despite its widely dissimilar products. There is no doubt that in 1929 the industry met its responsibility to the public in supplying adequately all paper needs; but there is great doubt as to how it met its responsibilities to itself.

New alignments in business, remarkable technical progress and substitution of products have been particularly marked in the paper industry since the war; in fact many aspects of the industry are undergoing radical change. It is evident that the industry has outgrown the clothes that in former years fitted comfortably.

It is searching for new ones. In the search there is the inevitable struggle between those who wish the new and those who desire to retain the old. The American paper industry finds itself today in this analogous situation—in a transition in which elements of both the old and the new compete. The terms of such a competition cannot be equal.

But slowly the realization that uncontrolled, natural competition between highly individualistic units is a destructive competition, is leading to the new realization that the equilibrium essential to the fulfillment of all responsibilities demands an active control in which individual purposes are submerged in the greater interest of which they are but a part. From a chaotic struggle in which each company contends with all others, there is emerging a willingness for team-play. In a conscious effort to exert upon business the control and guidance that it must have, the paper industry, like other industries, is turning to its associations. Through them it is searching for the means of curing overproduction.

The industry's associations are today extending their activities into every conceivable phase of the manufacture and distribution of paper. Detailed reports covering production, shipments, stocks, costs, prices of raw materials, exports and imports, consumption, technical research and control, and a host of other subjects are currently being supplied the producers in many grades. The more progressive members are taking advantage of this information. Many mills, however, continue the out-of-date policies that have brought difficulties at some time or other to all industries; they continue to produce paper without regard for market conditions.

But something more than partial information on the industry is needed. Practically every producer must have not only a detailed account of conditions in his own branch, but he must have an adequate picture of conditions in all other branches with which he competes. The sulphite wrapping paper manufacturer needs to know developments in kraft, in boards and in bags; the writing producer is handicapped if he cannot ascertain conditions in book paper, and the New England mills must know what are the conditions of competition in other regions. These and many other matters transcend the scope of the group associations; they demand coordination through a central agency. This coordination of information is one of the outstanding jobs of the American Paper and Pulp Association.

Because of the many common grounds in the industry, principally common sources of raw materials, common methods and technique of manufacture, possibilities of wide substitution of pulps in manufacture and of products in meeting consumption requirements, the American Paper and Pulp Association has other important functions that can be handled adequately only through a central organization. How the Association has met the industry's needs during the past year is the purpose of this report.

The activities of the American Paper and Pulp Association fall into two classes, staff activities conducted by executives continuously employed by the Association and committee activities, largely related to policies. The accomplishments of the Association in 1929 are discussed below under appropriate headings:

Association Management

The Association undertook its 53rd year's work under the direction of Major O. M. Porter, who had the year previous succeeded Dr. Hugh P. Baker as Executive Secretary. By virtue of his intimate knowledge of conditions in the industry and his familiarity with association activities, Major Porter was able to set up a clear-cut, concise working plan to which the year's activities have conformed. The plan centered in an aggressive campaign to increase the association's service to the industry in order that it might have more dependable data for use in formulating company policies. Major Porter's efforts did much to increase the prestige of the Association and to consolidate activities along lines of specialized and routine service to the industry. The Association and the industry owe much to the resourcefulness and the ability of Major Porter.

In July 1929, Major Porter left the Association to take charge of the National Kraft Paper Manufacturers Association. The Executive Committee appointed Charles W. Boyce, formerly Assistant Secretary, as Acting Secretary to carry on the activities of the Association until a permanent reorganization could be effected. Throughout the summer Mr. Boyce continued the policies which had been established by Major Porter.

At its meeting on September 18, 1929, the Executive Committee appointed Jesse H. Neal, general manager of the Association. Mr. Neal assumed charge of the administration and reorganization activities of the Association on November 1, 1929.

During the past year the efforts of the Association's staff have been concentrated particularly upon the tariff presentation, in promoting the waste utilization and stream improvement work, in increasing the scope and efficiency of the Association's statistical service, in investigating the economic aspects of pulpwood supply and production, and in expanding direct service to member mills and affiliated associations.

Service to Members

The Association's service to members comprises three different but closely related activities; publication of the Weekly Business Review, compilation and distribution of the Monthly Statistical Summary and special reports, and handling member requests for special information by direct mail and by confidential news bulletins.

Weekly Business Review

In 1929 the Weekly Business Review has been continued with much the same editorial policy as in 1928. Its lead articles have been devoted, however, more specifically to discussions of conditions in the industry and of general economic conditions that affect the industry, rather than to the affairs of the Association. In addition the summary of market, financial and raw material conditions has been amplified to meet more adequately the needs of the industry. The Weekly Business Review fills an important need in the industry; it has received much favorable comment not only from the industry itself but from bankers and economists who find in it a dependable, consistent source of information.

Statistical and Special Reports

The statistical reports of the Association during the year have been expanded to present a more complete picture of conditions in the industry. Special efforts have been made to obtain reports from a larger number of mills to form a more adequate basis for comparisons in the Monthly Statistical Summary, which is distributed to the members of the Association and to affiliated associations. The context of the summary has been carefully edited; the major trends in the industry are now shown graphically as well as statistically.

In addition, the Association issued a pamphlet covering the general statistics of the industry, two pamphlets on the tariff situation and one dealing with the utilization of white water and the reduction of fibre losses in the industry. These pamphlets had wide distribution throughout the industry. The Woodlands Section prepared a monthly bulletin for distribution by the Association under the title of "Pulpwood."

Direct Service

The policy of giving prompt attention to the requests of members for information has been rigidly followed throughout the year. The number of requests for information has increased materially and the scope of information sought has broadened. A large number of requests for information concerning sources where paper may be purchased, have been received. These have been forwarded to member companies.

In order that the executives of the industry may be kept more thoroughly informed concerning general activities in the industry and in the Association, a confidential news service to executives has been initiated. Bulletins will be issued from time to time as source material becomes available. A similar news bulletin deal-

ing with waste utilization and stream improvement, entitled "Wastes or Profits" has been started. Another series has been planned for the Supply and Equipment Section of the Association.

Statistics

The Association's statistical service was further strengthened and expanded during 1929. J. A. C. Kavanagh deserves especial commendation for his tireless drive to secure a complete statistical picture of the industry and to present general and special statistical reports in a clear, concise manner.

The Association now prepares current reports and charts for nine important sections of the industry. In addition it summarizes the reports covering most of the other groups—which are prepared by the group associations—to give a complete picture of the statistical position of the industry every month. During the year the Association established and conducted statistical systems for the National Kraft Paper Manufacturers Association and the National Sulphite Paper Manufacturers Association and it also organized the reporting of production statistics on wall paper, which was later taken over by the Wall Paper Manufacturers Association.

Through Mr. Kavanagh, the Association has devoted much effort to educational and extension work in the industry to emphasize the importance of dependable, comparative reporting, and to impress upon executives the value of statistics as a basis for the formulation of sound business policies. Several papers have been read and several articles and charts have been prepared for the trade journals. In addition the Association has cooperated closely with the Department of Commerce in connection with both the census of distribution and of manufacture, and with the extension of foreign trade.

The following regular reports are prepared by the statistical service department for the American Paper and Pulp Association: 1. Weekly Business Review. 2. Monthly Statistical Summary. 3. Weekly book paper special report. 4. Monthly boxboard reports in cooperation with the Paperboard Industries Association. 5. Monthly soda pulp reports and charts.

For affiliated associations: 1. Bag Paper Manufacturers Association—Weekly and Monthly Statistical Report. 2. Binders Board Manufacturers Association—Reports and Quarterly Charts. 3. Cardboard Manufacturers Association—Weekly Reports. 4. National Kraft Paper Manufacturers Association—Weekly Statistical Reports and Charts. 5. National Sulphite Paper Manufacturers Association—Weekly Statistical Reports. 6. United States Pulp Producers Association—Monthly Reports.

In addition the department has conducted the following special services: 1. Preparation of weekly general and identified reports and charts for National Kraft Paper Manufacturers Association. Questionnaire of 1927-1928 on kraft operations. 2. Preparation of weekly individual mill reports and annual charts for National Sulphite Paper Manufacturers Association. 3. Preparation and publication of American Paper and Pulp Association bulletin No. 6—"Useful Statistics on Paper and Pulp." Preparation of 1929 edition of "Graphic Presentation of the Paper and Pulp Industry in the United States." 4. Cooperation with the Department of Commerce Advisory Committees and the United States Chamber of Commerce in the preparation of forms for the Census of Manufacturers and the Census of Distribution. 5. Direct cooperation with the Bureau of the Census in gathering and publishing data on the Annual Census of the paper industry for 1928. 6. Cooperation with the Bureau of Foreign and Domestic Commerce in obtaining foreign statistics. 7. Cooperation with the Cost Association of the Paper Industry in educational work on statistics. 8. Analysis of two years' statistics for Wall Paper Manufacturers Association.

Waste Utilization

The accomplishments of the Association in waste utilization and stream improvement during 1929 fully justify the effort which the Association has devoted to these activities. Under the competent direction of Mr. C. M. Baker, the Association's engineer, the Association has studied carefully the possibilities and methods of white water utilization. It has continued the development of harmonious relationships with state agencies and it has initiated mill service to members of the Association and to non-members who contribute to the activity.

During the year C. M. Baker prepared a bulletin entitled "White Water Utilization." This was issued by the Association and met with favorable comment throughout the industry. It did much to stimulate interest in the possibilities of reducing fibre loss.

During the year a special information service on waste utilization and stream improvement was initiated. Under the title of "Wastes or Profits" pertinent and carefully checked information is assembled and distributed, from time to time, to the members of the Association and cooperating mills. This service has received very favorable comment. The results of these activities are covered in the annual report of the National Waste Utilization and Stream Improvement Committee, which is published together with a detailed description of Association activities in a separate pamphlet.

The industry's reception to the Association's activities in waste utilization and stream improvement is brought out in a forceful manner by the following quotation from a mill official's letter:

"I have felt ever since the inception of this program that it would prove one of the most important and progressive measures instituted by the Association, and one which could not fail to be of very great value to the membership."

Woodland Section's Service

Through the Woodlands Section the Association has taken an outstanding leadership in investigating the economic possibilities of forestry for pulpwood production and in collecting information that bears upon the costs of pulpwood and pulpwood cutting, under the direction of Charles W. Boyce.

The members of the Association are kept informed on pulpwood prices and on activities relating to both pulpwood procurement and production through a monthly publication entitled "Pulpwood." The purpose of this publication is to present in an impartial manner the business possibilities of pulpwood production, and their relation to other competitive factors in the industry. In a word, the Association is considering forestry strictly as an element in the business of manufacturing paper. It has stripped sentiment and generalities from the picture in an effort to analyze pulpwood forestry upon a business basis, exactly as any other business would be analyzed.

During the year a significant series of studies of present and future pulpwood prices in the major papermaking regions, was started. Committees of outstanding foresters and woodlands managers were selected in each region to make a preliminary, economic study and analysis of both present and future conditions that affect the price of pulpwood. These studies were undertaken to give to the industry the broad picture of conditions which underlie forest management, and to the executives facts needed in the determination of business policies in regard to forest land and pulpwood ownership and purchase.

These studies are significant in the history of forest utilization in the United States for they represent the first attempt of an American wood-using industry to get at the real economic facts of forestry as a business. It is in keeping with tradition that the Association should continue in this way as a leader in national forestry matters.

Supply and Equipment Section

During the past year, 10 new members have been added to the Supply and Equipment Section of the Association as a result of a membership campaign. Much effort and attention was devoted by Mr. W. N. Wilkinson, President of the Section, to the formulation of plans of activities for the Section with the result that a comprehensive plan of activities has been prepared as a basis for next year's program.

During the year the Executive Committee of the Section held several meetings at which problems of the industry and relationships with the American Paper and Pulp Association were discussed. As a result of these meetings, the Section was authorized to contribute to the support of the activities of the American Paper and Pulp Association and particularly to further work in waste utilization and stream improvement. A committee was appointed to cooperate with the American Paper and Pulp Association in the conduct of its waste utilization and stream improvement activities and to arrange for more aggressive pursuit of this activity.

Foreign Contracts

Working through Mr. Marquard H. Lund, recently appointed Commercial Attache at Oslo, Norway, the American Paper and Pulp Association has made some progress in establishing regular interchange of statistical information with associations in foreign countries. Mr. Lund has not had as yet much opportunity to devote his energies on this work. He has, however, established contacts with foreign manufacturers and associations from which results can be expected in the forthcoming year.

The Association has cooperated with the Paper Division of the Department of Commerce and through it has obtained and published much information on conditions in the industry in foreign countries. This service is being expanded as conditions permit.

Conclusion

The foregoing reports indicated clearly, I believe, that the industry has an organization in the American Paper and Pulp Association which not only is needed, but is contributing definitely toward the welfare of the industry. Moreover, its contributions are especially significant in view of the limited expenditure of funds.

Important as these activities are, however, the possibilities of service have hardly been scratched. There lies ahead, not only for the American Paper and Pulp Association but for all Associations in the industry, wider fields of usefulness. To render the greater services, all urgently needed in the conduct of modern business, greater financial and cooperative support is needed. No organization can function properly, no organization can give to its members the information and assistance that they perhaps unknowingly need, without thorough going and practical cooperation. As the individuals in society need control for the common good and as they themselves must contribute to the establishment and maintenance of that control, so also must the members of business societies be mutually controlled. The trade association is the outstanding medium for control—for the self-regulation of industry; it constitutes in a large measure the government of business.

It is therefore, gratifying to know that the Executive Committee of the American Paper and Pulp Association, having considered these and other factors, have selected Jesse H. Neal as General Manager of the Association and have given to him the task of guiding the American Paper and Pulp Association toward those broader, more urgently needed purposes, which lie ahead in Association work. Experienced in Association activities, resourceful and pleasant, Mr. Neal comes to the industry well prepared for the work.

In conclusion, I wish to extend my thanks to the members of the Association staff for their cooperation in the conduct of Association affairs. Their loyalty and willingness to work hard, were essential in maintaining and developing the service which Major Porter had laid out. J. A. C. Kavanagh, statistician and Mrs. Oliver J. Rogers, Office Manager, were especially helpful.

SIMPLIFICATION AND STANDARDIZATION

The Committee on Simplification and Standardization of the American Paper and Pulp Association met on February 17, 1930, to discuss its report to the Association. The following motion, stating the position of the committee was passed.

Moved: that the Committee on Simplification and Standardization is in favor of any practical standardization in the future and is ready and anxious to consider the possibilities of promotion of any such activities, and that it is the opinion of the committee that the manufacturers and merchants are in favor of standardization of size, count and weight of paper, but that after a thorough investigation throughout the trade it is found that the standardization of grade of paper is impractical at this time as evidenced by the following reports of subcommittees dealing with the situation in important paper grades.

Report of the Book Paper Sub-Committee of the National Standards Committee Covering the Suggestion of the Department of Commerce That Steps be Taken to Simplify and Standardize the Paper Industry

At a Standardization Conference Meeting held on November 14, 1929, at the New York City offices of the American Paper and Pulp Association, it was made clear to the book paper manufacturers present that it was the desire of the Department of Commerce, backed by the opinion of the Bureau of Standards, definite standards in the manufacture of book paper. It was understood that this request was made with the idea that the establishment of such standards would eliminate much of the present waste, and some uncertainty, in buying and selling book paper. We also gathered the impression that the Department of Commerce, backed by the opinion of the Bureau of Standards, felt that it would be a feasible matter to establish definite standards of content and of service. It was suggested, if possible, that these standards should be set up ready for the approval of the book paper manufacturers at the annual meetings of the Paper Trade Associations in February, 1930, and that following such a vote of approval, the standards thus approved would be recommended by the Bureau of Standards.

The purpose of this report is to point out some of the difficulties which face the book paper manufacturers in the working out of such a proposal. Book paper manufacturers recognize the desirability of all possible simplification of the book paper industry. The question is, however, whether the Department of Commerce realizes the stupendous nature of the task which it has asked them to undertake. We wonder if the Department realizes that the establishment of standards in the book paper industry will mean comparatively little without the simultaneous establishment of standardization both of the methods by which paper is converted into printed pieces and of methods of use after it is printed.

Factors Involved in the Standardization of Paper From a Content and Process Standpoint

The Bureau of Standards is, of course, familiar with the fact that practically any plant, bush, or tree, can be used as the basis of the fiber in book paper. It is also familiar with the fact that there are two general processes of manufacture; the mechanical process and the chemical process, and that term book paper comprehends such paper made from any fiber, from the very best grade of rags down to a paper made with a large content of mechanical wood pulp, and any combination of various fibers. Some mills, for the sake of economy and because of the availability of the stock, employ old papers in the manufacture of book paper, such mills being especially equipped to convert that material into new book paper. It is a well known fact that the value of any paper making fiber depends in a large measure upon the skill and care with which it is manipulated, so that to arrive at a proper standard of content, a definite standardization of process would also have to be set up.

Because of the inter-relationship of fiber and process, the book paper manufacturers are at a loss to know where to begin to set up content standards that would have any real meaning or any understandable application to the purchase and use of book paper.

In the manufacture of coated book papers there are still greater opportunities for conflict of opinion than in uncoated papers. There is no standard of relationship between coating and body stock, and it is doubtful if manufacturers could be brought to agree upon a standard.

Factors That Affect Standardization of Service

The Bureau of Standards must know that the conversion of book paper into printed pieces is not a fixed and unchanging process. Printing processes are constantly being improved; new processes are being introduced and developed, and the demands upon paper as the background for such printing processes are constantly changing. The last twenty years has seen the introduction of the Offset process; has seen it practically supplant stone lithography. Rotogravure has also been introduced and has made very rapid progress. Letter press printing has been speeded up year after year for the past twenty years. Each speeding up puts a new demand upon printing papers. In addition to this, binding processes have been revolutionized, and drying processes, too, have been revised to meet the needs of faster operation. Many of these processes actually change the character of the printing paper in the process of conversion. Add to this, the fact that there is no control of humidity or temperature in the average printing plant throughout the United States, and you thus face complications that check any attempt at standardization of service factors. For instance, a book paper that will fold to excellent advantage at a humidity reading of 65 per cent may be absolutely worthless at a humidity reading of 20 per cent. Inks which will be perfectly satisfactory at a temperature of 75 degrees may ruin a book paper at a lower temperature. An ink that does no damage to the surface of a book paper at a speed of 1500 impressions an hour may do a lot of damage at a speed of 2500 impressions an hour. And these factors are again complicated by the relation of inking areas to paper surface areas. It is useless to attempt to designate a standard of service in printing quality and folding and binding quality, unless the printing industry is prepared to standardize its processes of conversion. If the setting of service standards for paper were possible, it is not improbable that by the time the standards had been set and put into operation, the development of some new printing process would set the standards aside.

Standards Established in Other Industries

We are told that standards have been established in the steel and other industries and therefore—why not in the paper business? The manufacture of steel bears no close analogy to the manufacture of paper. Paper manufacturing in many respects assumes the nature of an art rather than a science; and, as we all know, the arts do not lend themselves readily to standardization. Paper, and particularly book paper, is the vehicle that carries the Graphic Arts, than which there is no art more exacting, more changeable or less susceptible to standardization.

Selection of Standards for Specific Needs

The book manuafcturers are prepared to work in conjunction with the Bureau of Standards on any specific problem that may affect a sufficiently large number of purchasers of paper. On the other hand, they feel that the working out of a very elaborate set of standards such as would be necessitated by the present complex requirements of users and converters of book paper involves a tremendous waste of time and money, which would never be offset by the advantages to be gained. It is their belief that the greatest safety and the greatest economy for any buyer or group of buyers of paper in this country lies in selecting a reputable manufacturer or manufacturers of book papers and making clear to that manufacturer or manufacturers the particular requirements for any specific need. Any standard thus set will have a definite meaning.

Simplification of Sizes

As a practical starting point for the activities of the Bureau of standards, the book paper manufacturers would suggest that this Bureau continue its work along the direction of simplified sizes for the book paper industry. If the sizes could be cut down to the number previously advocated by the Bureau it would be a forward step in the direction of lowered manufacturing costs. It would also help to reduce the carrying charges for paper throughout the country. This program, as the Bureau is probably aware, has been partly nullified by a regulation of the post office department. This regulation stipulates that the minimum number of pages in a book, or catalogue, which may receive the minimum postal rate, is 24 pages. Twenty-four pages is not an economical unit to print, nor can it be printed, except in rare instances, from the simplified sizes recommended by the Bureau of Standards. If the Bureau of Standards, and those who are working with them on book paper questions, would put pressure on the postal department to reduce this 24 page minimum to 16, it would go a long ways in helping to promote size simplification. Few 24 page units fit the present printing equipment.

Book paper manufacturers would also like to suggest as another starting point that an effort be made to acquaint the converters of book paper with the ideal conditions under which paper should be handled. If some uniformity could be brought about in the matter of printing and binding conditions, then it might be possible for the book paper manufacturers to consider further steps in the simplifications of specifications and grades.

Respectfully submitted,

George Olmsted, Chairman, Book Paper Sub-Committee.

Standardization of Quality of Writing Paper

The suggestion of the Bureau of Standards of the Department of Commerce, looking toward further standardization of papers has received the interested consideration of the Writing Paper Manufacturers Association as well as the Cover Paper Manufacturers Association, and both go on record as thoroughly in favor of standardization, and as evidence of this, we refer to the standardization already accomplished in connection with size, weight and count of paper.

The suggestion is now made that further standardization should take place as to the ingredients, and the percentage of same used in the manufacture of paper—the standardization also, as to the physical qualities of the paper, probable life of same, etc. In this the manufacturers feel that such attempted standardization would be impractical, ineffective and often misleading, for the following reasons:

1. Paper making is an art rather than a craft. Art is an intangible. There is no rule of measurement that can at all time be applied to an intangible. No two mills using identical materials will produce an identical character of paper. The process in itself is as important as the material used, and consequently, the materials contribute only partly to the desired results.

2. It is not believed that physical tests such as the folding qualities and pop tests are entirely significant elements in quality, and the physical test alone cannot be considered a measure of the strength, and much less the life of the paper.

3. The life of a paper is very frequently dependent upon the particular conditions that surround it, and while there are certain general rules that may be laid down, based on the materials used, nevertheless, both the process and the particular conditions surrounding the paper and its use, may have considerable effect on its life.

4. The qualities of strength are for many practical uses subordinated to appearance, printability, attractiveness, workabilty and other qualities, and consequently specifications for strength and durability would be misleading.

Therefore, it is our belief, based upon experience and fact, that a statement of the qualities as suggsted would be entirely misleading to purchasing agents in the major portion of uses, and therefore is as undesirable as it is impractical.

R. F. McElwain G. S. Morse A. R. Smith	Representing Writing Paper Manufacturers
B. A. Franklin	Representing Cover and Manifold Manufacturers
H. W. Hixon	Representing Bristol Manufacturers

Report of Sub-Committee on the Standardization of Index Bristols

Following the meeting of the Standardization Committee, appointed by the American Paper and Pulp Association, held in New York on Nov. 4th, a letter of inquiry was addressed to all manufacturers of Bristols who regularly produced such product.

A report has not been received from all these but a sufficient number of reports have been received to establish a strong feeling:

1. That Standardization of a kind is highly desirable and that this seems to have been pretty well done in so far as sizes, weights, packages, etc. Trade customs, both for index Bristols and Mill Bristols have been established which make it possible for prospective users to know just what manufacturing limits can be applied to all grades.

2. There is no uniformity of the machinery of production which will allow a Standardized product. Two mills, side by side, under the same management, would produce different results in making the same grades with the same furnish. This can even be applied to two machines in the same mill.

3. Because of lack of ability to produce identical results, it has been necessary for each manufacturer to standardize in accordance with his estimate of the demands of the market. The results of this has been that there has been built into the different sheets, so to speak, a standard of quality of that particular manufacturer, which has probably been changed and modified to meet existing and changing conditions. A manufacturer, therefore, presents his product and relies on his ability to determine its market value.

4. The actual furnish can be changed to give different results by the way the stock is beaten, the speed on the machine, length of fibres, etc., and it is impossible to standardize those features of manufacture. Rags are of many qualities, but they show the same chemical tests. The process itself is as important as the materials used, so that the materials contribute only partially to the desired results.

5. Physical tests are very misleading. A High Schopper Folder Test does not show resistance to all kinds of wear and is very misleading. It varies greatly with relative humidity. The same furnish can be so altered by the process of manufacture as to give radically different Mullen Tests, even though the same uses is intended. These tests cannot be considered as indicating the strength or life of paper.

6. Most manufacturers feel that a paper is made to do a certain given job and if there is frankness and confidence between the producer and the buyer, much more can be accomplished than by any attempt at Standardization expressed in terms of symbols or descriptions and having regard to furnish and mechanical tests.

Summary of Report Sub-Committee on Standardization of Blotting Paper

The following quotations are taken from a letter from J. P. Massie, Acting Chairman of the Sub-committee on the Grade Standardization of Blotting Papers.

"I have been talking with Mr. Grump, President of the Standard Paper Manufacturing Company, this morning, about this matter of Standardization and he agrees with me in thinking that there is nothing further that the blotting paper manufacturers can do at this time. As you probably know, we have had for some time in the blotting paper industry, a Standardization of sizes and weights.

"We have a certain number of recognized grades of paper to which at least the leading manufacturers of blotting paper adhere fairly well and it is not desirable for us to announce the definite contents of our various papers.

"In this matter of standards, blotting paper is not entirely similar to other grades such as bond, ledger and some grades of book paper. Blotting paper is always bought for immediate use and never for permanency; consequently, a buyer can judge from a sample whether it has the necessary requirements for his purpose in appearance, absorbency and printing qualities.

"I am sorry that I have been unable to present this matter to the other manufacturers, but I believe that you can take the attitude of those two companies; Standard and Albemarle as being indicative of the whole industry."

Summary of Report Sub-Committee on the Standardization of Envelopes

No regular report was submitted by the Sub-committee but the following quotations were taken from a letter by the Chairman, R. L. Allison.

"We believe that the envelope industry believes in Standardization that is now in effect with regard to weight, count, etc. At the meeting in New York the Writing Paper Manufacturers felt that Standardization regarding quality was impractical. If it is impractical in the manufacture of paper, it is, of course, impractical in envelopes.

"In our experience no two mills make the same grade of paper from the same ingredients, therefore, it is a mill matter.

"The present Standardization in the envelope industry appears to be all that is required and covers weight and count of paper on the folio basis."

FELLOWSHIP AT MADISON

C. C. Heritage presented the First Report to the American Paper and Pulp Association and the Technical Association of the Pulp and Paper Industry on the work of the A. P. & P. A. Fellowship at the Forest Products Laboratory, Madison, Wis., as follows:—

This is the first of a series of semi-annual reports to the American Paper and Pulp Association covering the work of the A. P. & P. A. Fellowship instituted at the Forest Products Laboratory, July 1, 1929. This report will deal generally with the field of research selected, the particular problem undertaken, the method of attacking the problem, the results secured thus far, and the practical aspects of the work. It is not intended to present scientific data in detail at this time but rather to make clear the nature of the undertaking, its broad specific interest to the member mills, and the expected practical value of the results. Formal technical presentation of the results will be made from time to time before the Technical Association.

The Selection of the Field of Research

The pulp and paper industry deals essentially with four materials, the sheet, the stuff, the pulp and the wood, each of which is related to the next through the variables of the processes by means of which each is transformed into the other. Precise knowledge of what is happening in each of these processes, depends basically upon the ability to evaluate accurately these four materials.

To evaluate a material is to determine its fundamental properties and to express the results in numbers, technically correct and precise. These tools for the satisfactory measurement of properties are a prerequisite for sound technical advance in the industry.

Which of these four materials deserve first attention? The whole structure of the pulp and paper industry depends upon the capacity of the sheet as marketed to fulfill the requirements imposed by the particular conditions of use. These requirements can always be translated into corresponding physical or chemical properties. If these requirements are known and the properties are numerically determinable, the foundation is laid not only for providing a superior commodity for the particular use at a profit, but also for continuing the study and analysis back through the operating variables to the stuff, the pulp and the wood with their respective properties.

These matters are all of vital interest to the entire membership of the American Paper and Pulp Association. Each mill, operating machines, producing commercial paper or paper board, preparing stuff and manufacturing or purchasing pulp, is faced with the basic problem of supplying at a profit a product superior for the

requirements of use. Each mill is faced with the necessity for determining precisely, the physical and chemical properties of the finished sheet in order that they may know for a certainty that the sheet will satisfy the requirements of the trade.

This interest is just as keen as the study passes back to stuff and to pulp. Pulp evaluation has been a subject for discussion and study for years, but the futility of evaluating pulp without due regard to the properties of the commercial sheet to be made and its particular use, is rarely realized.

Therefore the field of research selected is that of new and improved methods first for the evaluation of paper, the second as may develop, for the evaluation of stuff and of pulp. This field touches directly the business of every mill in the Association, is the very foundation of the technical structure and holds excellent possibilities for results of large practical value.

The Selection of the Particular Problem

It is self evident that the physical properties of the sheet are as a rule much more important than the chemical properties and the problem is therefore limited by considerations of maximum utility to physical properties only.

Physical properties may be classified generally into those pertaining to the surface and those pertaining to the entire sheet. Color and finish are typical of surface properties. The penetration of liquids, the various strength and the various rigidities are typical of the *structural* properties, those existing by virtue of the entire sheet. This second class of properties appearing as structural attributes, was chosen as the more important field for immediate research, and since practically every use to which paper is put calls for resistance to rupture upon the application of an external load, the study deals particularly with strength phenomena.

In considering paper as a structure, we have a material which is to a considerable extent analogous to the usual materials of construction. It is no more non-homogeneous or discontinuous than timber or ceramic materials. Since a sheet of paper in its simplest form without sizing or loading consists of felted fibers separated more or less by air spaces, this structure is capable of analysis into at least two major elements, namely, the percentage by volume of solids and the arrangement of the fiber elements relative to each other (in three planes) or the fiber arrangement. Thus in dealing with any physical property dependent upon structure, it would appear that it is impossible to arrive at the corresponding property of the fibers of which the sheet is composed from a test of the sheet itself, without passing through the intermediate and corresponding property of the structure by means of which it is possible for the fibers to manifest themselves as a sheet. On the basis of the foregoing, an hypothesis may be established.

It is axiomatic that the properties of the sheet itself as tested do not come about accidentally but must be related in some rational manner to the properties of the fibers of which the sheet is made. The same fibers or stuff going on the wire may produce sheets of very different sheet properties depending upon the manipulation of the variables of the paper machine; and conversely different stuff going on the wire may produce sheets of very different sheet properties if the variables of the paper machine are held constant. The paper machine can only control the structure of the sheet, namely the volumetric composition and the fiber arrangement and of course the actual sheet dimension (caliper). The hypothesis may therefore be expressed in this way. The properties of the sheet itself, of its particular form and dimensions must be derived from the corresponding properties of the fibers as modified by the structure of the sheet and by the actual dimensions of the test piece. The sheet or test piece property value factored for actual test piece dimensions is some mathematical function of volumetric composition, fiber arrangement and fiber properties.

It was stated that the study deals particularly with strength phenomena. There are several kinds of strength as recognized by engineering theory. The commonest and perhaps the simplest with which to deal is strength in tension.

If the hypothesis is correct it should be possible to identify the four manifestations of tensile strength namely:

(1) that manifested by the particular test piece as employed of finite dimensions which may be termed sheet strength in tension.

(2) that manifested by the particular structure existing in the test piece, as evaluated by percentage solids by volume in the test piece, regardless of dimensions, which may be termed structural strength in tension.

(3) that manifested by the particular fiber arrangement existing in the structure regardless of volumetric composition, which may be termed formation strength in tension; and finally

(4) that manifested by the particular stuff regardless of arrangement which may be termed potential (not actual) fiber strength in tension.

The first of the foregoing, sheet strength in tension, is easily determined and expressed as load at rupture in tension per unit width of specimen (pounds per inch). This is the phase of tensile strength which is important purely from the use standpoint, since a particular sheet of particular dimensions must withstand in use a load of definite magnitude without rupture. The second, structural strength in tension, is easily calculated in exactly analogous manner to that of any structural material as load per unit cross sectional area at rupture (pounds per square inch). This is the phase of tensile strength involved in designing a sheet to have certain sheet strength and in manipulating the paper machine variables to secure certain structural strength. The third, formation strength, represents that manifestation in regard to which there has been no information prior to this work. Knowledge of it is likewise necessary to design a particular sheet and to improve the design and to control the variables of the paper machine to secure certain formation strength. And the last, potential fiber strength in tension, is the basic or fundamental phase about which there is no information, but concerning which knowledge must be had in order to select the pulp and control the refining variables.

It will be recognized that this hypothesis considers a sheet of paper purely from the subjective standpoint without relation to any of the processing variables which produced the sheet. This is greatly to be desired because the material (stuff or pulp) of which the sheet is made can be evaluated correctly and precisely regardless of the particular procedure used to secure the sheet. This matter of choosing a particular empirical procedure is one of the most disturbing elements in the repeated attempts to standardize pulp testing through the medium of hand made sheets.

Mention must be made at this point of the present practically universal procedure in paper testing of dividing the sheet or test piece property value such as pounds load at rupture in tension per inch of width, by the ream weight, which weight it should be remembered is only definable as the weight of an *area*. In this case the result is termed "breaking length" being that length of sheet which when supported at one end will rupture in tension at the support (if of uniform cross section and of uniform strength), under its own weight. It is well known that the volumetric composition of sheets from identical stuff and of identical basis weight may be varied with consequent variation in "breaking length" and also that volumetric composition may be held constant for sheets from identical stuff but of variable basis weight (variable caliper) and again the breaking length varies. Although it must be recognized that this unit has served some purpose in rough paper evaluation work, its physical significance in the structural conception just outlined is open to considerable doubt particularly where precise mathematical relationships are being sought.

The particular problem selected may be stated either in terms of paper or of pulp. The problem is concerned with a study of the fundamental structure of paper as manifested in the tensile strength of the sheet, of the structure and of the fiber. Or stated conversely the problem is concerned with a study of the potential tensile strength of the fibrous material of which a sheet is made

through knowledge of the effects of the structural variables on the sheet strength as experimentally determined.

The Results Secured Thus Far

The study has not been under way long enough to announce definite results but tentatively the following statements may be made:

Through the analysis of data recorded in the literature, considerable evidence has been obtained that the hypothesis that fiber properties are related to sheet properties through structure, has basis in fact.

An approximate analysis leads to numerical values for the four expected phases of tensile strength, namely "sheet," "structural," "formation" and "fiber," and an approximate mathematical extension may be calculated when the potential fiber strength in tension is known for a particular stuff and the caliper and basis weight of the sheet are assumed.

A more precise mathematical relation is being developed to relate structural strength and formation strength which involves the effect upon structural strength of variable volumetric composition of the sheet. The constants of this more precise expression appear to behave rationally and significantly relative to the refining and bleaching of pulps. Sheets have been produced and the data analyzed at several degrees of beating using several spruce sulphites, a gum sulphite and a tamarack kraft.

These basic studies require the establishment of precise methods of measuring and expressing numerically at least five phenomena:

(a) Sheet strength in tension
(b) Sheet dimensions, particularly caliper
(c) Volumetric composition
(d) Fiber arrangement
(e) Basic fiber properties, such as actual dimensions, form and surface conditions.

Work upon all these matters is progressing, principally as a part of the regular program of the Forest Products Laboratory.

These basic studies require particularly fine technique in the preparation of uniform handsheets of wide variety as regards caliper, volumetric composition and stuff employed. This technique has been acquired and uniform reproduceable results obtained. This has been by no means a simple matter.

The Practical Aspects of the Work

In case the study is successful in establishing the relationships sought, certain very attractive practical possibilities present themselves:

1. Rational evaluation and design of papers.
2. Rational evaluation of pulps using hand sheets.
3. Possible evaluation of pulps in water suspension without the necessity for producing hand sheets.
4. Rational expression of and correlation of the effects of the paper making variables upon sheet properties.
5. Rational expression of and correlation of the effects of the refining variables upon sheet properties.
6. Rational expression of and correlation of the effects of the pulping variables upon sheet properties.

The interest of the paper mill is in designing and producing a sheet of the requisite strength with the lowest ream weight at the least cost per pound. The means will be available, if the study is successful, to select the optimum pulp and the optimum refining and paper making conditions to produce the sheet properties desired in the most economical manner.

RESOLUTIONS

The following resolutions were unanimously adopted at the annual meeting of the American Paper and Pulp Association:

Research and Technical Control

WHEREAS, more efficient and complete utilization of materials and labor reqiure extensive research in developing new processes and in modifying existing methods, and

WHEREAS, technical control in the mill promotes efficient production and eliminates waste;

BE IT RESOLVED, that the American Paper and Pulp Association encourage research and the installation of technical control throughout the industry in suitable manners;

That the Association urge governmental and institutional research agencies to continue and expand investigations in pulp and paper products, and

That one central research committee be appointed by the President of the Association as a preliminary step in coordinating the research activities, not only of the industry but of all agencies;

BE IT FURTHER RESOLVED, that the utmost cooperation be given to the Technical Association and to the Superintendents Association of the Pulp and Paper Industry in their endeavors to the end that manufacturing procedure may become more efficient and technical control and research may be advanced through the interchange of ideas at their meetings and through the widespread publication of informative materials;

That the cooperative fellowship plan whereby the American Paper and Pulp Association and the Technical Association of the Pulp and Paper Industry and the News Print Service Bureau mutualy contribute to the research program at the Forest products Laboratory be further endorsed.

Affiliated Associations

BE IT RESOLVED, that the Association expresses its hearty appreciation of the friendly and cooperative spirit evinced by all its affiliated associations in the handling of national problems common to all branches of the Pulp and Paper Industry; and

BE IT FURTHER RESOLVED, that the Association urges the unqualified support by all paper groups, of the plan for a National Paper Council which was earlier today made a part of the Constitution of the Association, as promising the effective coordination of the whole paper industry on a fair and equitable bases, the strengthening of all its constitutent parts, and the earlier accomplishment of its national aims.

Statistics

WHEREAS, dependable statistical information dealing with all phases of paper production, shipments and stocks is indispensible to the successful conduct of business in the paper industry, and

WHEREAS, accurate statistics dealing with production, shipments and stocks of the individual grades of paper are essential in adjusting supply to demand, and

WHEREAS, the industry needs adequate information on the distribution of all pulp and paper products;

BE IT RESOLVED, that the American Paper and Pulp Association urge more intensive development of statistical reports among the grade associations, the collection and compilation of statistical records by the American Paper and Pulp Association in the unorganized groups, and the current coordination of the grade statistics through the statistical service of the American Paper and Pulp Association; and

BE IT FURTHER RESOLVED, that the association cooperate with the Department of Commerce in the collection of statistics on distribution and that the association be encouraged to undertake studies of distribution methods and of costs in cooperation with other associations, and independently when such studies relate to the industry's national distribution problems.

Foreign Trade

BE IT RESOLVED, that the American Paper and Pulp Association be urged to undertake the development of export markets insofar as practicable; and

BE IT FURTHER RESOLVED, that the Executive Committee be requested to authorize such activities and such expenditures of Association funds, as will in its judgment, serve to stimulate interest of foreign buyers in the products of American paper mills, and acquaint the members of the American Paper and Pulp Association with opportunities for profitable foreign trade.

Waste Elimination and Stream Improvement

Whereas, the National Committee on Waste Utilization and Stream Improvement and the Association's engineer have made material progress in furthering white water utilization and saving fiber losses by the publication of pertinent, concise bulletins and news notes, and by personal contact with cooperating mills, and

Whereas, harmonious relationships have been established with state officials and mill representatives in the adoption of constructive rather than prohibitory state legislation affecting stream improvement, and

Whereas, the disposal of pulping liquors, particularly from sulphite pulping, constitutes a serious problem in stream improvement;

Be It Resolved, that the National Committee on Waste Utilization and Stream Improvement and the Association's engineer be commended for their efforts; and

That the efforts of the Technical Association of the Pulp and Paper Industry in working out many of the details relating to this problem be also commended.

That the industry be urged to cooperate with these agencies and with the Supply and Equipment Section of the Association in the installation of thoroughly proven remedial measures;

That these agencies be urged to direct further attention to the problem of pulping liquor disposal in order that the industry may be kept informed of feasible utilization processes and that costly duplication of investigative effort may be avoided.

Dues

Whereas, the American Paper and Pulp Association at its annual meeting in February, 1927, adopted unanimously the principle of financial support based upon the total gross sales of individual company members, and

Whereas, the Association at its annual meeting in February, 1929, requested its Executive Committee to work out a fair and equitable plan of annual dues based upon the first mentioned principle; therefore

Be It Resolved, the Association records its belief that the time has arrived to put the plan into active operation under the constitutional prerogative of the Executive Committee to determine the method of financing the organization, to the end that the Association may be enabled to render a service worthy of the industry; and further that the cost may be distributed fairly and equitably among all members.

Arbitration

Whereas, arbitration has proven satisfactory in the settlement of disputes, without the delay and expense of court action, and

Whereas, arbitration is legalized in many states and as well as by the federal government, and

Whereas, decisions rendered in arbitration are upheld by the courts;

Be It Resolved, that the President of the American Paper and Pulp Association be empowered to appoint a committee representing the American Paper and Pulp Association, and to invite the National Paper Trade Association, the Association of American Wood Pulp Importers, the National Association of Waste Material Dealers, and the American Arbitration Association to appoint representatives thereon, to consider for report at the next annual meeting of the Association suitable arbitration clauses for inclusion in contracts in the industry, and to urge upon the members of the several associations the more general use of arbitration.

Cooperation

Whereas, disregard of economic conditions in industry results in over-production, and

Whereas, agreed curtailment of production in conformity with demand is in illegal restraint of trade, and

Whereas, the adjustment of supply to demand so urgently needed to permit amiable stabilization of markets must be left to the individual action of mills in the industry;

Be It Resolved, that all members of the industry cooperate with the American Paper and Pulp Association and with its affiliated associations in furnishing individual statistical records; and

That the Association prepare for distribution throughout the industry a concise statement within legal limitations concerning the interpretation of statistical informaton; and

That the individual manufacturers be urged to establish independently, sales and production quotas in conformity with the business conditions in the industry as disclosed by the statistical reports for publication by the American Paper and Pulp Association.

Costs

Whereas, fair and reasonable profits are essential for continued operation of the pulp and paper industry on a sound economic basis, and

Whereas, the severe competitive conditions existing in all grades have reduced selling prices so that such profits are not being obtained, and

Whereas, a substantial proportion of our Capital is invested in Fixed Assets, which depreciate through wear and tear as well as obsolescence, so that the total annual loss in value is an appreciable cost item, and

Whereas, if fair and reasonable profits are to be obtained, every cost factor must be included

Be It Resolved, that the American Paper and Pulp Association urges upon all that they make a proper provision for depreciation and obsolescence of their Fixed Assets and duly charge the same into their costs.

Forestry

Whereas, the Woodlands Section of the American Paper and Pulp Association was recently adopted a resolution essentially reaffirming the forestry policy of the association.

Be It Resolved, that the American Paper and Pulp Association endorse the above mentioned resolution and that the association continue and expand its activities through the woodlands section.

Courtesy

Whereas, the officers, members of the Executive Committee, and our volunteer workers on other Committees, have devoted themselves whole heartedly, many times at the expense of personal convenience, to promoting the best interests of the whole paper industry;

Be It Resolved, that the members of the Association tender them their sincere thanks, together with assurances of their continued support of all future efforts to develop a worthy and representative organization; and

Be It Further Resolved, that the Association express its appreciation and thanks for the faithful and intelligent service of its headquarters staff during the past year.

In Memorium

Resolved, that the Association voices its sorrow over the loss of those friends and co-workers who during the year were called to that undiscovered bourne from whence no traveler returneth, and expresses its appreciation of their valuable contributions to the welfare of the industry, and

Be It Further Resolved, that their respective companies be informed of this tribute to their memories.

W. E. Brown, president, Rhinelander Paper Company.

Samue Connell, treasurer, Northwestern Pulp and Paper Company.

Warren Curtis, president, Tonawanda Paper Company.

F. A. Empsal, vice president, St. Regis Paper Company.

Alton Faunce, Price & Pierce, Ltd.

George F. Fowler, president, Hampden Glazed Paper Company, Valley Paper Company.

Willard Hitchcock, secretary-treasurer-president, American Wood Board Company, Blandy Paper Company.

J. J. Jansen, secretary, A. P. W. Paper Company.

J. P. Jones, Harding Jones Paper Company.

G. F. Kent, Standard Paper Company.

Clarence I. McNair, general manager, Northwest Paper Company.

T. F. Merseles, president, Johns-Manville Corporation.

Paul N. Myers, president, Waldorf Paper Products Company.

Henry W. Somers, president, Iroquois Pulp and Paper Company.

Wm. F. Tait, president, Tait & Sons Paper Company.

James Rogers, president, J. & J. Rogers Company.

W. D. Uptegraff, president, Defiance Paper Company, Niagara Wall Paper Company.

WOODLANDS SECTION

The morning session of the Woodlands Section was devoted to reports of foresters from the different paper making sections. In all sections the paper industry was reported as being active in developing forest growth to provide raw material on which the paper industry depends for 90 per cent of its production.

P. T. Coolidge, of Bangor, Maine, speaking for New England said that the practice of forestry is becoming a recognized program of all the paper mills in that territory with forest land being managed on a sound business basis. The chief difficulty in New England was, he said, the protection of the young trees from fire and insect damage. He estimated that the total growth in the pulpwood forests in New England can be increased to over 4,000,000 cords at a cost of approximately $1.40 per acre. The New England Committee of which Mr. Coolidge is chairman, has found that there is likely to be no shortage of pulpwood in New England.

"Forestry as a means of producing pulpwood in the Lake States is a decidedly promising business venture under the proper conditions," stated W. A. Munro, Munising Paper Company. As chairman of a committee representing the paper industry, Mr. Munro presented a thorough analysis of forestry in the Lake States, based upon the committee's findings.

The Lake States constitute one of the most important paper making regions in the United States. Practically all of the pulpwood required to maintain the large production of paper is cut in the region.

There are vast areas of forest land in the region, which if used for forestry purposes, would yield much more wood than is now used. All of this land, however, is not economically suited to use by private owners because of the inaccessibility and poor fertility and restocking of cut over lands; companies must therefore exercise great care in selecting lands for forestry purposes.

Mr. Munro points out that the costs of forestry in the Lake States are more than the possible returns except on the better lands. On these lands, however, the economic chances of successful forestry are distinctly good, capable of yielding returns as high as 5 per cent compound interest upon the investment.

"It is cheaper to grow pulpwood on lands near the mill in the Adirondack region than to buy it at present stumpage prices," stated John F. Preston, of the Hammermill Paper Company, Erie, Pa. In a highly technical and carefully balanced paper, Mr. Preston analyzed the economic opportunities of forestry in New York and Pennsylvania. Mr. Preston's paper is one of a series presented at the Woodlands Section meeting dealing with the economic possibilities of forestry in the paper making regions in the United States.

There are approximately eighty pulp and paper mills in New York and Pennsylvania producing more paper annually than any other region in the United Etates. Adequate pulpwood supply is therefore a vital question Mr. Preston's analysis brought out the fact that this region can continue to maintain its leadership by simple forestry and at the same time do it cheaper than using naturally grown wood.

R. S. Kellogg, chairman of the National Forestry Program Committee, in introducing the following resolutions, said that the paper industry had taken the lead among all American industries in promoting the forestry policy approved by both houses of Congress.

"Our industry," he said, "believes that forestry must be a sanely developed national program and the success of this program is dependent upon economic considerations."

WHEREAS, the ownership and management of forest land as an integral part of the paper industry is subject to the economic laws that govern business competition; the practice of forestry by the industry is subject to handicaps inherent and governmental with which no other business contends; by lack of knowledge of technical and scientific procedure and by uncertainty in regard to future financial returns; and

WHEREAS, to eliminate these handicaps and to stimulate the extension of forestry in accordance with economic laws demands leadership in directing public and private attention to the responsibilities of the owners of private forest land and of the public in the establishment and success of a national forest policy; and

WHEREAS, governmental regulation intending to control management of privately owned land in defiance of economic principles and of property rights is incompatible with American institutions and American business tradition, and is wholly unnecessary if forest owners are guaranteed the same rights that are vouchsafed to other business;

RESOLVED, that the American Paper and Pulp Association shall continue and amplify the activities of its Woodlands Section in investigating the economic feasibility of practical forest management for pulpwood production and that the fruits of such investigation be made fully available to the members of this Association for the purpose of informing them of the policies which may be followed with economic success in the management of their forest properties, and that the Association, through the Woodlands Section, shall undertake research in forest management, coordinate research activities of member companies and urge and support research activities on the part of governmental and institutional agencies to the end that the members of the industry may undertake cultural measures on suitable lands with reasonable assurance of success and with consequent lessened financial risk, and that the Association through its members and through its staff exert continued aggressive leadership in originating and supporting governmental activities and legislation that are directed towards the elimination of economic and governmental handicaps to the practice of commercial forestry.

BE IT FURTHER RESOLVED, that the American Paper and Pulp Association endorse the following principles as representing the industry's understanding of public and private responsibility in relation to the management and protection of the forests of the United States:

Private owners of forest land should so manage their forests as to meet their responsibilities to the public whenever and wherever economic conditions and general business standards will so justify. The private owner should not be expected to incur cultural investment upon lands which exhibit no visible chance for commercial profit. To this end the private owner should undertake cooperative activities among which the following are important:

1. Technical and economic investigation and analysis to determine the feasibility of forest land management under different silvicultural conditions.

2. Investigation of types and conditions of forest land economically suited to timber production.

3. Investigation and adoption as rapidly as possible of methods to increase utilization of forest material and to reduce waste.

4. Investigation of the possibility of reducing the financial hazards of forestry through timber insurance.

5. Standardization of units of measure, grades and use requirements of products.

The owners of private forest land are entitled to the same governmental guarantees and protection that are accorded to other businesses. Public cooperation in forestry is as yet far from comparable with that given other business. Especially the following are needed:

1. The full protection from forest fire destruction of all privately owned lands as well as public lands, in order that forest properties may be insurable at reasonable rates and may thereby enjoy the credit advantages of ordinary business, and also protection from the appalling losses from floods and erosion so far as the same can be controlled.

2. The reform of tax laws on forest lands to conform with the unique character of such property and of its management as a business industry.

3. The management of publicly owned lands which amount to more than 20 per cent of the total forest area of the nation to stabilize rather than to depress prices by coordinating selling policies and conditions with market needs.

WASTE UTILIZATION REPORT

John D. Rue, chairman of the Committee on Waste Utilization and Stream Improvement, delivered the following report:—

The industry during 1929 has made material progress in its attack upon the problem of waste utilization and stream improvement. The closing up of white water systems and the installation of pulp saving equipment has been proceeding throughout the industry and is removing much of the objection which has been raised to the discharge of suspended matter with waste water.

For the water soluble wastes, especially sulphite waste liquor, there are still no methods of disposal or utilization, the practical value of which is sufficiently proven to justify recommendation by the committee. Interest in the disposal of these wastes is rapidly increasing and several companies are spending large sums for research and development in the search for a practical solution to the problem. The committee through the sub-committee on sulphite wastes is endeavoring to prevent undue duplication of effort.

That the industry is wholeheartedly supporting the work of the committee and of Mr. Baker, the Association engineer, and that the work is proving effective is evidenced by such comments as the following which have come to the attention of the chairman:

A mill official says: "I have felt ever since the inception of this program that it would prove one of the most important and progressive measures instituted by the Association, and one which could not fail to be of very great value to the membership."

A general manager says: "Since I saw you in New York last February, lightning struck down here in Maine out of an absolutely clear sky, and I have no hesitancy in saying that the existence of the National Committee and my connection with it played a most important part in the controlling of the situation which had all the possibilities of tremendous danger to the mills here in the state of Maine. Mr. Baker's data was invaluable, and the talk which he gave at an informal gathering of the mill representatives with the State officials clarified the whole situation, so that instead of adverse legislation with intolerable regulatory measures we now have a constructive, cooperative program outlined."

A mill president says: "You are perfectly correct in the statement you make that there is going to be an increasing pressure brought to bear on the mills in regard to disposing of their waste waters. The State of Ohio is making quite a little progress along this line, and it was only last week I was talking to one of the mill managers regarding this same matter. He stated that the State of Ohio would undoubtedly become very active in the near future in regard to waste utilization, and that the mills will very soon have to have a closed system."

Another mill manager says: "We feel that this is one line of work that has produced results and that the majority of the mills in the Association view it in the same way."

From the State Department of Health comes this statement: "In Ohio this department has noted a very favorable change in the attitude of paper manufacturers of the state regarding the importance of waste recovery and the protection of streams. We believe that this awakening of the industries is due in a very large measure, to the special effort expended by the American Paper & Pulp Association during the last two years.

"At the time this work was undertaken by the Association as you are no doubt aware, the most acute stream pollution problem in Ohio as related to the paper industry was caused by waste water discharged from straw board and paper board mills. The straw board manufacturers had already accomplished a considerable improvement in their manufacturing methods as a result of the activities of this department and the paper board group had shown an increased interest in their stream pollution problem. Apparently, however, except in one or two instances the fine paper manufacturers were relatively disinterested.

"At the present time we find that the fine paper manufacturers of this state are alive to the possibilities of waste utilization methods and generally speaking have individually investigated their waste disposal problems and installed equipment of various kinds to recover usable raw materials. We feel that this change has come about principally due to the educational work carried on during the last two years by the Association. Considerable good also has been accomplished in furthering the work already started by the straw board industries and in interesting the paper board manufacturers in carrying on research work relative to their stream pollution problem."

From another State Board of Health: "It is my opinion that Mr. Baker is doing very valuable work in the development of a program which not only tends to reduce objectionable stream pollution but also brings a financial return. In view of the progress already made in this work and also the numerous problems still needing consideration from the waste utilization and stream improvement points of view, it is believed quite essential that financial support be given Mr. Baker's activities."

On recommendation by the Committee, the Association has put the work of waste utilization and stream improvement on a budgetary basis, an action which places it on a sound financial footing for future development. An effort is being made to develop also a practical means of financing under Mr. Baker's supervision, a service to mills in regard to problems pertaining to waste.

I take pleasure in transmitting herewith the annual report of the Association engineer, Mr. C. M. Baker. Mr. Baker's report gives an excellent and encouraging summary of the year's activities in regard to the utilization of waste and to the purification of streams and also outlines briefly an excellent program for the coming year.

ENGINEER'S REPORT

C. M. Baker, engineer of the American Paper and Pulp Association, delivered the following report on progress in Waste Utilization and Stream Improvement in 1929:—

Consistent with policies approved by the National Committee, February 20, 1929, more specific attention has been given during the past year to white water utilization and the rendering of individual mill service. Largely upon the request of mill executives, 38 mills have been visited. Two mills have been materially assisted in litigation cases in which stream pollution was involved.

The cooperative programs between the state and industry initiated last year, however, have not been neglected. In fact programs have been set up in additional states. In some cases existing programs have been more completely perfected.

"The Closed White Water System," a publication calling the attention of mill executives to the general problem of white water utilization, has been distributed to the industry. A second publication, "White Water Surveys," has been prepared but not yet

issued. In addition several papers read by the Engineer at various organization meetings, have been published in the trade journals.

Many requests have been made for the services of the Association's Engineer in white water utilization. The development of a limited mill service appears to have met practically universal approval. In all cases the cooperation of the mill has been excellent Reports or memoranda, outlining the observed situation and making the suggestions that seemed pertinent, have been prepared and submitted to the mill officials. In many instances these suggestions have been carried out by the mill officials to the economic advantage of the industry.

During the past year considerable service has been rendered to mills involved in litigation. The extent of this service has warranted making a charge of $1,100 in addition to actual expenses, which will be used to help carry the Association's activities during the interim from November 1 to April 1, the beginning of the Association's fiscal year.

The white water utilization demonstration undertaken last year in a tissue mill, is being continued. Negotiations are also in progress with a fine writing paper mill for a similar demonstration. It is believed that this will be of material value since preliminary surveys indicate that there is extravagant waste in mills of this classification.

Although no special demonstration has been undertaken in the paper board industry, sufficient data are available to indicate that closed, or substantially closed, systems are practical in all instances, that will eliminate almost, if not entirely, its problem of stream pollution.

Technique in the analytical determinations in connection with white water utilization varies so widely in different mills that comparable results are seldom secured. This question was referred to a committee of the Technical Association of the Paper Industry which has worked on the problem during the past year. A preliminary report was presented at the Richmond, Va., meeting in September, 1929. This report is to be revised and presented again at the February meeting of TAPPI where it will probably be adopted as a tentative standard. This should assist materially in securing comparable and reliable results.

Sulphite waste liquor still constitutes the most objectionable source of pollution from the pulp and paper industry. In every state where there are sulphite mills difficulties are encountered. State officials, and others interested in improved streams, are becoming impatient because no definite solution of this problem is available. Numerous mills are spending large sums individually to develop a satisfactory solution. No industry-wide cooperative program, however, has as yet been initiated.

The most recent development consists of the Howard Precipitation Process, developed during the past two years at the Marathon Paper Mills, Rothschild, Wisconsin. It has been carried through the pilot plant stage and involves fractional precipitation. Calcium sulphite is thrown down in the first stage of precipitation and used in making fresh cooking liquor, while organic substances are recovered in the second stage and used as boiler fuel. It is reported that under average Wisconsin conditions the value of the recovered products "will carry the process and show a net profit on the operation and that the residual tail liquors from the process show 75 per cent or better reduction in oxygen demand as compared with untreated liquor."

A number of mills are evaporating a part of their sulphite waste liquor and using the residue in some form or another. One mill in Washington is pumping waste liquor several miles, storing it in tanks, and discharging it with the outgoing tide. Maintenance of the pipe line is difficult because of corrosion of the metal bands of the wood stave pipe, however, and hauling the waste to tidewater in scows with a large additional capital expenditure and heavy maintenance cost is now being considered. Even with the present method of disposal, which provides great quantities of diluting water, complaint is made that the wastes from the mill interfere with the propagation of oysters in beds located several miles from the point of discharge. Investigations by representatives of the State Board of Health and of the mill, however, indicate that such is not the case. Nevertheless, an investigation is now being made by representatives of the Federal Bureau of Fisheries. If the findings should be against the mill in this instance the results might seriously affect all sulphite mills in the Puget Sound region.

A California mill has been forced to spend large sums to dispose of its sulphite waste liquor to prevent deleterious effect upon a public water supply of a Nevada city. A satisfactory economical solution of the problem at this mill has not yet been developed. It is claimed that wastes from sulphite, soda, and sulphate mills located on the James River in Virginia interfere with the operation of the water purification plant of the city of Richmond. Although this contention has not been verified, representatives of the city who have made a careful survey and study, are positive in their conclusions. Should these contentions be substantiated, the expenditure of hundreds of thousands of dollars on the part of the industry may be necessary to correct the condition.

Unquestionably the sulphite waste liquor problem is the most serious and predominating phase of the stream pollution problem. It seems essential that the industry initiate immediately a definite, constructive, cooperative program looking toward a satisfactory solution. This work is being ably organized by a special sub-committee of the National Committee.

Legislation in regard to stream pollution has been or is being considered in a number of states. A law formed after the Wisconsin legislation was enacted in West Virginia at the last legislature. This appears to be satisfactory to industry. Laws enacted in Michigan and Illinois set up separate or individual boards for the control of stream pollution activities. In Michigan this results in two state departments having jurisdiction in the matter and it is believed that in Illinois three or four different departments have concurrent jurisdiction; a condition which is obviously unsatisfactory.

With the convening of state legislatures further stream pollution legislation may be expected. It behooves the pulp and paper industry, therefore, to keep in touch with the situation that such legislation may be developed along rational lines.

Cooperative activities in stream improvement initiated in several states last year have been continued, perfected, and extended.

Two bills on stream pollution considered unfavorable to industry were defeated in the Maine Legislature during its last session. In connection with the consideration of these bills, however, a conference was arranged at Augusta, Maine, with the Governor, state officials, representatives of sportsmen's organizations, and industry, at which a cooperative program was initiated. A committee representing the pulp and paper industry was appointed, including the following: Joseph A. Warren, S. D. Warren Company, Cumberland Mills, Maine; Rex W. Hovey, Oxford Paper Company, Rumford, Maine; Robert Nivison, Hollingsworth & Whitney Company, Waterville, Maine; C. E. Stanwood, Great Northern Paper Company, Millinocket, Maine; W. J. Brennan, St. Croix Paper Company, Woodland, Maine.

In Massachusetts activities for improved streams have been initiated in certain localities by the Izaak Walton League. As a result of conferences which have been held, with local officials of this organization and with the mills involved, it is believed that no serious difficulties will be encountered. A number of mills have been visited in Massachusetts and advised regarding white water utilization.

In Wisconsin one of the outstanding developments during the past year has been a preliminary survey of white water utilization and stream improvement conditions in practically every mill by representatives of the State Board of Health in cooperation with mill officials. A general report upon these surveys was presented at a recent meeting of the Wisconsin Advisory Committee of the Pulp and Paper Industry on Waste Disposal. A detailed report regarding its own problems is being sent each mill. Much valuable information was secured by these surveys, and arrangements are

being made for publication of the general report in abstract form.

Consistent with the program set up, a survey has been made of certain streams in Virginia during the past summer. State officials have recently requested the cooperation of the Association's Engineer in a study of local mill expenditures in waste utilization and stream improvement. A complete report of these investigations will be prepared by the state officials at a later date. It is probable that legislation will be considered in this state during the coming session.

The States of Mississippi and Louisiana have been visited and contacts made with state officials. Several mills have also been visited and advised regarding white water utilization and stream improvement. One mill in Mississippi that is involved in stream pollution litigation has received substantial assistance from the Association's Engineer.

During the year the engineer made a preliminary survey of conditions in the Pacific Coast states. A number of mills were visited, and conferences were held with numerous pulp and paper mill men.

By court order a joint committee has been appointed by the states of California and Nevada to direct the method of waste disposal at the California mill which is having difficulty disposing of its waste material. It is understood that this mill is required to prevent at least 90 per cent of its sulphite waste liquor from discharging into the stream.

In Oregon, the State University has sponsored the development of a state committee to study the problem of stream pollution with a view of developing legislation. The Engineer discussed the various problems with this committee. During the past summer surveys of conditions in the Willamette River, the most seriously polluted river in the state, indicated a dissolved oxygen content of only about 3½ parts per million above the city of Portland, Oregon, with a stream flow of about 4,000 seconds feet. Below the city the dissolved oxygen was less than one part per million. The paper industry is represented on the state commitee, and it is believed that any legislation proposed will be along rational lines.

Because of the importance of the fishing industry on the Pacific Coast, mills in this section need to be exceptionally cautious regarding their waste disposal. Close contact with state officials and sincere cooperation on the part of mill officials is essential if rational policies are to be maintained.

In the past the Association's activities in waste utilization and stream improvement have been financed by the solicitation of voluntary contributions from both member and non-member mills. It is generally conceded now, however, that the work is on such a permanent foundation that it should be financed as a regular Association activity in connection with the development of mill service, as outlined below:

1. The Association should underwrite and make available the necessary funds for continuation of the work.

2. Contributing non-member mills shall be extended the same privileges as members of the Association in this particular work.

3. Mill service to the extent of preliminary surveys to individual mills should be continued without charge.

4. Extension of the service beyond preliminary surveys should be encouraged and provided, and a charge made to cover the Engineer's salary and expenses.

5. Service to non-member, non-contributing mills might be extended as conditions permit, with a charge of actual expenses plus two times the regular salary of the Engineer.

A total budget of $15,000 for next year's activities of the Association has been suggested. This will cover all activities of the present personnel.

The program of future activities should include:

1. Maintenance and extension of the cooperative programs between the industry and state officials in the various states. Continuous contact in this respect must be maintained to assist state officials and the industry in improving stream conditions without interfering with industrial developments.

2. Continuation of the service policies with individual mills in solving their white water problems and regarding stream pollution where specific difficulties are encountered.

3. Extension of studies and research regarding disposal of other mill wastes including sulphite waste liquor, lime sludge, and liquid wastes of sulphate, straw board, and paper board mills.

4. Extension of mill service as the demands for it develop.

It is believed that during the coming year more specific and detailed studies should be directed toward sulphite waste liquor utilization. It will be recalled that during the first year of activities efforts were confined almost exclusively to the organization of cooperative programs in the various states. During the past year we have concentrated upon the problem of white water utilization. It seems logical and consistent, therefore, that next year's activities may be directed more specifically to the problem of sulphite waste liquor utilization or disposal. This undoubtedly constitutes the most serious and objectionable source of pollution from the pulp and paper industry.

COST ASSOCIATION

Intense interest was shown in the twenty-fourth semi-annual meeting of the Cost Association of the Paper Industry, held at the Hotel Pennsylvania on Tuesday and Wednesday, February 18 and 19. On Tuesday morning, the proceedings were opened by President Ralph B. Hersey, of the Hollingsworth & Vose Company, Boston, Mass., who in his warm address of welcome said in part:

"In opening this twenty-fourth semi-annual convention of the Cost Association of the Paper Industry, I wish to express to the members of this association my deepest appreciation for the honor which you have chosen to bestow upon me in electing me to serve as your president for the year 1930. I am eager to give to the association whatever time and effort is necessary in order to promote better accounting procedure in the industry.

"In behalf of the association, I welcome you to New York City and to the meetings of this Convention. I hope everyone made the registration period a time not merely for the registering of his name but accepted that time as an opportunity to become better acquainted with the other fellow, so that he may enter the meetings of this convention and other conventions to come with a deeper sense of fellowship. The success of these meetings depends upon you and I, and we will get out of the meeting just what effort we put into them.

"Let us be on time for each session. Let us be attentive to the speakers and gather together all constructive thoughts which will aid us in our work. Let us join in the discussions with enthusiasm and pep. The cost meetings in the past have been noticeably successful for their discussions. Let us continue to make them so in the future. Let us relate our own experiences and ask questions, then we will learn from each other and the speakers helpful information to carry back home.

"Let us enjoy the social contact which should always exist at meetings of this sort. If these few suggestions are carried out, our cost meetings should be a success.

"The Increasing Importance of Knowing your Costs During 1930" is to be the keynote of this address of welcome. Business conditions are constantly changing and are making it imperative that manufacturers seek improved methods of cost finding and have a thorough knowledge of their costs. The Cost Association can and will in the future aid the manufacturers in bringing about better methods of cost procedure.

"The trend in business today is larger production and greater sales; but the unfortunate part of it is that the productive growth is far more than the demand. With such a condition as that existing, we find that business is a little bit more difficult to obtain than in the past. With this condition we have keen competition. What follows keen competition? The answer is a narrowing profit margin. In times such as these the concern that has a good sound cost system and correctly applies it into the business will be able to cope with keen competition. It is essential that executives have before them the facts and figures about their business so that they

may be able to make better decisions for larger profits and help make the whole industry more healthy.

"I just mentioned a phrase 'good sound cost system.' By this I mean a system based on the following principles:

"First: A method of allocating to the manufactured product all expenditures for the normal operation of a plant.

"Second: To set standards through a budget plan and through experience so that the operating end of the business will have a goal to obtain in future production.

"Third: To point out items of cost to those responsible for the various items of cost and to hold them accountable, and

"Fourth: To determine on the various grades manufactured the profit on each.

"Only a few days ago I came across an article which seems to bring out clearly the thought which I wish to leave with you about the importance of the cost accounting during 1930. The article stated the following line of thought: "The danger in American industry is not entirely the lack of business, but in the failure to maintain prices that include a reasonable profit. Business must overcome the price cutting idea in an attempt to keep operating 100 per cent. It must adopt the idea of using the formula of total cost plus profit.

"Does this condition exist in the paper industry? If so, we cost accountants have a real job to perform in placing before the executive of the business a true picture of the facts and figures.

"In closing I want to state that I am an enthusiastic believer in the value of the educational work the Cost Association is doing in the industry. I also want to take this opportunity to commend the very excellent work that our secretary and treasurer, Thomas J. Burke, is doing for our association.

"I ask every member to co-operate in the work so that this Association will be successful in bringing about a greater degree of uniformity in the accounting procedure in the different groups of the Pulp and Paper Industry."

The other speaker at the opening session was Earl B. Morgan, consulting management engineer, of Philadelphia, Pa., who discussed "Personal Problems in Management," in an instructive and interesting manner, which was greatly appreciated by those present.

At the afternoon session, Eric A. Camman, C.P.A., partner, Marwick, Mitchell & Co., New York, gave an authoritative talk on "Standard Costs, What They Are, and How to Use Them." His address was followed with a spirited discussion.

Thomas W. Howard, late director of the Cost Bureau of the United States Chamber of Commerce, and now director of the Accounting Bureau of the National Electrical Manufacturers Association, discussed "Cost Work In Trade Associations," in a comprehensive manner.

J. A. C. Kavanagh, statistician of the American Paper and Pulp Association, opened the Wednesday morning session with an interesting address on "The Census of Distribution and the Pulp and Paper Industry." He said in part:

"The Census of Manufactures is the regular Biennial Census which calls for the 1929 production figures. The forms to be filled out will be received by the individual mills through the mails and will be returned in a similar manner. No agents will call upon the manufacturers unless the reports are unduly late. Some manufacturers have asked, 'Is the filling out of the census forms mandatory?' It is mandatory but the Bureau of the Census prefers to encourage the voluntary cooperation of the manufacturers. These schedules should be filled out as promptly as possible and returned to the Bureau of the Census. The Bureau can publish preliminary releases on the industry within three weeks after the receipt of the reports.

"The Census of Distribution is a new census and is the first national census of distribution to be taken in this country although there was a preliminary Distribution Census taken in eleven representative cities about three years ago. This census will cover all the retailers, wholesalers, etc., totaling about 2,000,000 establishments. There are approximately 6,000 Federal Agents to do this work. Distribution data to be furnshed by the manufacturers will be included on the Biennial Census of Manufactures forms."

"Waste in distribution is still enormous in this country. It is natural that practically in every economic process there should be some waste, and the elimination of as much waste as possible is the problem of scientific management. The old methods of distribution are still struggling for survival and are refusing to coordinate themselves into the new system of more scientific management, although it is quite evident that every dollar saved in distribution expense is a dollar added to net profit.

"Market research is doing for marketing or distribution what production research has done for production. This analogy will be readily appreciated because you are familiar with the efforts of production efficiency.

"Our country is so tremendously large in territory; manufacturing is so highly localized; and the standards of living are so much higher than in many other lands, that a vast and exceedingly complex machinery necessarily came into existence to bridge the ever-widening gap beween producer and consumer. This distribution machinery has now grown so complex and has so many ramifications that few individuals indeed have any real conception of what it actually is, of what elements it is composed, and how it functions, let alone any true knowledge concerning the merits and deficiencies of any of the numerous agencies of which it is composed.

"It is for these and many other reasons that the business men of the country, including our manufacturers and bankers, have felt for some time that in order to carry on our domestic commerce with a reasonable degree of efficiency it is just as necessary to have some statistics concerning domestic distribution as it has been in the handling of the export and import business. The Census of Distribution comes to the merchants and manufacturers as a response to their own desires and wishes, and it is up to everybody to help make it as valuable, practical and useful as we all wish it to be.

"It is important to bear in mind that the Census of Distribution is not a complete survey. Only basic facts will be gathered. Intensive studies of this kind can be carried on later through surveys of various types. It is probable that one of the greatest values of the Census of Distribution will be in furnishing basic data and in pointing the way to needed studies of an intensive nature. It will serve as a starting point and lend perspective to what individuals and associations shall later decide to do for themselves."

Following Mr. Kavanagh's address, George S. May, president of George S. May, Inc., New York and Chicago, gave an instructive talk on "Bonuses and Their Uses to Decrease Costs and Increase Profits." His speech was thoroughly enjoyed and was followed by a lively discussion.

COMMITTEE ON TARIFF

Milton E. Marcuse, chairman, presented the following report for the tariff committee:—

In making its report on the work of the past year on the readjustment of the tariff, your tariff committee wishes to point out that the method in which the paper industry has handled this problem has been such as to win the approval of even those who are politically opposed to the basic theory of protection. What the outcome will be is a matter still dependent on the political situation at Washington, rather than upon any method of campaign that the paper industry may adopt.

And, at this point, it might be noted that in a session of Congress filled with prolonged sharp debate and investigations, the paper industry has not been one of those to suffer the attacks so generally made against other groups of manufacturing interests. In following a program of proper presentation of the facts, the committee has taken no step that could bring its activities within the scope of that kind of "lobbying" which has been so vigorously denounced. We have carefully refrained from activities which might justify similar criticism.

The method of procedure was entirely different from that pursued in former tariff revision campaigns, and also different from the methods followed by many other industries. We believe that our course has been such as to earn favorable consideration at Washington, but no one can tell what will be evolved from the political maelstrom, and we make no predictions as to the nature of the provisions for paper which will be made when a tariff bill is finally passed.

It was recognized long before the actual writing of a tariff bill was begun, that a revision or readjustment would come before the Congress, and the American Paper and Pulp Association realized the necessity for early preparation for the campaign. A general tariff committee was formed, with sub-committees representing the various branches or groups of the industry, and plans were made to handle the entire tariff campaign as a unified movement in behalf of the entire industry.

This plan has been followed throughout, with the exception that one or two groups preferred to handle their own problems. As contrasted with such groups, other groups, not affiliated either as associations, and in some cases not even made up of mills belonging to the American Paper and Pulp Association, joined with the association for this unified presentation.

Wise, Whitney & Parker were retained as counsel by the general tariff committee, to take charge of the entire matter; not to make presentations to Congress or to individual members of Congress, but to direct and advise as to the campaign to be conducted by the general tariff committee; to assist in determining the data to be presented, its collection and collation and the preparation of briefs and memoranda embodying such data and views of the industry thereon.

It was at this point in the preparations that the general tariff committee took the action which has made its activities so free from any possible political criticism. It was decided to ask only those changes in rates or phraseology which could be substantiated by facts, and to base requests for rate changes on the sound theory that the tariff should equalize the difference in cost of production in the United States and abroad.

This was possible because the paper industry was fortunate in having an organization not existing in any other American industry, the Import Committee of the American Paper Industry, which had for five years been acting for the industry in the enforcement of existing tariff laws. With wise forethought the Import Committee had foreseen the certainty of eventual tariff revision, and, in its efforts to secure complete enforcement of the existing laws, had collected all possible facts and data to indicate where changes in the existing law were justifiable.

The Import Committee was made consultant to the General Tariff Committee to make this data available to the industry, under an arrangement by which no charge would be made for the services of this consulting organization, except reimbursement for actual expenditures outside of its regular field of operations, as such expenditures could not properly be made from the committee's normal receipts which were pledged to enforcement alone.

Under this general program of activity the industry proceeded to organize its requests for tariff changes, keeping in mind from the start the inadvisability of asking for changes which could not be justified by provable facts.

Briefs on behalf of the industry in general, and of the various groups in particular, were prepared, and formal presentation made to the Ways and Means Committee of the House of Representatives, by the president of the association and by group spokesmen. When the House passed the tariff bill, the industry's position seemed to be justified by the consideration given to most of its requests. The bill then went to the Senate, where, at a hearing of the Finance Committee, additional data was presented to clear up some points which were doubtful in the minds of members of the upper house, and here again there were few changes adverse to the interest of the paper industry.

The next step in the progress of the bill was the action by the Senate sitting as a Committee of the Whole to consider the Finance Committee amendments, and the next step in the procedure is for the Senate, as a legislative body, to pass on the report of the Committee of the Whole. At this stage of the proceedings floor amendments to the bill are open for action.

The Senate Finance Committee report was acted on, with the exception of a few controversial items, on January 16, when most of the Finance Commitee items were approved without a roll call vote. On January 20 the controversial clauses were debated and acted upon.

Inasmuch as the bill has not yet been completed, it is not necessary in this report of general developments to itemize the changes made, as there are still possibilities of changes before a bill finally becomes law.

In general, however, it can be stated that Schedule Fourteen, not including the paragraphs devoted to books and other manufactured commodities, but relating to paper alone, covers 169 items of which the Senate Finance Committee report provided for increases over existing rates in twenty-seven. Most of these changes were increases of 5 per cent, two of 10 per cent, and one of 20 per cent.

The Senate, as the Committee of the Whole, granted twenty-six of the twenty-seven increases provided in the Finance Committee report, made one additional increase, but voted nine decreases from existing rates. It should be noted, however, that eight of these nine decreases were on the different types of photographic papers. This does not include changes in the application of particular provisions or rates which will result from changes in phraseology most of which are to the advantage of the paper industry.

This showing justifies your Tariff Committee's pride in the success of its program to ask changes in the tariff only where the need for such changes could be proved to be necessary to give the American mills an equal opportunity to compete in the home markets with their foreign competitors.

In closing, I wish, as chairman of the committee, to say again that whatever has been accomplished for the industry has been on the basis of the merits of our position, and while forecasts are dangerous, I will venture to predict that in the final outcome it will be found that the paper industry will have had at least as favorable consideration as any other American manufacturing industry.

The Committee wishes to thank the members of the industry for the support they have given the committee at all times, and bespeaks a continuance of this support until the bill is finally written into law.

SUPPLY AND EQUIPMENT SECTION

The annual meeting luncheon of the Supply and Equipment Section of the American Paper and Pulp Association, was held in the mezzanine ballroom on Tuesday, February 18th and was presided over by W. N. Wilkinson, president of the association. At the close of the luncheon the business meeting was held during which Mr. Wilkinson outlined the objects of the association and the activities it was carrying on in the interests of those manufacturers furnishing supplies and equipment of the plants of the industries. He emphasized the importance which membership in the Association would bring through close affiliation with the parent Association. He called attention to the interest which was now being taken in the association by supply and equipment manufacturers, by the increased membership during the past year.

Jesse H. Neal, the general manager of the American Paper and Pulp Association, addressed the members on the advantages which the association afforded them more closely to contact mill owners and executives and urged them strongly to make careful selection of the concerns which they took in as members, as to their integrity and standing in their respective lines.

Among others who delivered interesting talks were Charles W. Boyce, secretary of the American Paper and Pulp Association, who

outlined a series of service features which it was anticipated will be adopted whereby members of the Supply and Equipment Association will be kept promptly informed of doings in the industries which would be of most interest to them.

W. W. Cronkhite in his remarks, laid stress on the necessity of the individual members closely contacting the officers of the association and thereby reaping benefits which should accrue to them and which they would not otherwise obtain unless they did their share in keeping in touch with the association officials.

Arthur C. Bate, as chairman of the committee on "Utilization of Waste" reported on the activities of this committee and presented a resolution endorsing the policy of the American Paper and Pulp Association, in its efforts to improve the purification of streams.

Among the board of directors selected for the ensuing year are Eugene Merz, of Heller & Merz, W. W. Cronkhite, of the General Electric Company, Phillip Dennett, of the Bird Machine Company, Arthur C. Bate, of the Kalbfleisch Corporation, Howard C. Barber, E. A. Oren, H. A. Morrison of the Oliver United Filters, Inc., James Cameron of the Cameron Machine Company, W. N. Wilkinson, H. Stratton of Manhattan Rubber Company and A. Galliher of the Solvay Sales Corporation.

NORTHEAST FOREST STATION

George W. Sisson, Jr., chairman of the advisory committee to the Northeast Forest Experiment Station, presented the following report:—

The members of the Advisory Committee to the Northeast Forest Experiment Station have kept in touch with the work of the station and have advised concerning the research program upon which the activities of the station have been concentrated during the past year. The committee wished to call your attention particularly to the report upon the growth and yields of spruce in the Northeast, which the station published during the year. While much of the information contained in this bulletin is of a highly technical nature, its discussion of the possibilities of spruce yields in the Northeast are pointed and should command the attention of all producers of paper. The perpetuation or even the prolongation of the paper industry in the Northeastern section of the United States is closely related to this problem.

Fire hazard studies are being continued at various points in the area and a body of fact is being revealed that will be of great practical aid in diagnosing danger periods and make for more effective fire prevention.

The Northeast Forest Experiment Station has not been receiving the federal appropriation of funds that it should have or that other important stations in the country have received. Your committee urges the Association and the members in the Northeast to impress upon the United States Forest Service and the Bureau of the Budget the importance of investigative work in the Northeast and to increase appropriations as rapidly as possible.

It is the feeling of your committee that the association and its members should heartily endorse the work of the Forest Experiment Stations and contribute support and cooperative effort to hasten the attainment of results upon which much of our future management of forest lands depends. Member companies can help by keeping in close touch with the station personnel and can be of material practical assistance by making their own timberland holdings working laboratories where valuable data can be developed to the benefit of the entire industry.

COMMITTEE ON WOOD UTILIZATION

Reuben B. Robertson, chairman of the sub-committee of the national committee on Wood Utilization, presented the following report:—

The survey in North Carolina was completed under the chairmanship of Reuben B. Robertson. It developed 32,000 carloads of wood waste at wood working plants, not including wood used for fuel purposes. This information is tabulated in such a form that it gives the names of the concerns having wood waste, the kind of waste, species, and quantities. Most of this material is a potential source of raw material for fiber and pulp products. Another survey is now being conducted in Maryland, and other States are making arrangements for similar work in the near future.

The committee has made a successful test of Scandinavian gang saws, whereby small logs may be converted into lumber at a profit. This study is of particular interest to pulp mills, because the operation of this equipment might make it possible for certain pulp mills to diversify their products in cases where a certain species on their land is more suitable for lumber than for pulp.

Under the auspices of a committee of eleven engineers, architects, and builders appointed by Herbert Hoover, a 700 page handbook on wood construction was published during 1929. This book is of great value to pulp and paper mills, because it gives complete information in regard to heavy mill construction and gives other details in regard to use of wood in building and construction.

At present the committee is sponsoring a project on retail distribution of treated lumber in Ohio, and will later on extend the work to other States. Many paper mills have found it difficult to secure treated lumber in retail quantities since retail yards have not customarily handled these items.

The committee is now working with a number of paper mills for the purpose of encouraging them to supply kraft paper for manifold purposes. It is understood that large quantities of imported sulphite paper are used for this purpose. The work is for the time being limited to manifold paper used by the Government.

The committee is at present developing plans for a campaign for the education of the public as to the value of the insulation and sound deadening of homes. This project will be started during the present year.

The ultimate aim of the committee, which was established by President Hoover, is to make commercial reforestation feasible through increased utilization of wood. As part of its activities the committee is encouraging the coordination of by-products industries, with the saw mills as the center. Through its efforts much is being done toward bringing about a better understanding on the part of timber owners in regard to the importance of the pulp and paper industries in this utilization scheme.

SALESMEN'S ANNUAL MEETING

The Salesmen's Association of the Paper Industry held its annual business meeting at the Pennsylvania Hotel, New York, at 10:00 a. m. Tuesday, February 18th. The first hour was given over to the election of officers, and general business discussion, with the second half of the meting devoted to a speech by Irving Fellner, publishing director of *System,* a McGraw-Hill publication.

The speech given by Mr. Fellner, on the subject of "An Approach to a Marketing Problem" held the intense interest of the group, and presented some radical ideas on the application of four primary principles to the marketing problems of the paper industry. These principles were based upon a thorough study of distribution conditions throughout the United States, as exemplified by markets, buyers, channels of aproach, method of appeal.

Mr. Fellner presented as his chief contribution to today's marketing problem the elimination of undesirable markets, and concentration upon important sales outlets. He emphasized the fact that the customer's psychological reactions should be considered as a definite part of the salesman's training, and that motivating impulse, or the desire to buy, should be built up by continually stressing the valuable qualities of each particular product.

Many members of the Cost Association of the Paper Industry joined the Salesmen's group during this address, and representatives of each branch commented on the constructive application of the ideas expressed by the speaker.

The Salesmen's Association elected the following officers for 1929-30: President, S. R. Knode, Albemarle Paper Company,

Richmond, Va.; Vice-President, New England Division, Thomas Compton Walsh, Hollingsworth & Vose Company, Boston, Mass.; Vice-President, New York Division, Endicott Bantoul, International Paper Company, New York; Vice-President, Chicago Division, Harold Knott, of Chicago, Eastern Manufacturing Company; Secretary-Treasurer, Douglass A. Crocker, 18 East 41st street, New York.

It was also decided to operate the Miami Valley Division temporarily as part of the Chicago Division.

WORK OF IMPORT COMMITTEE

In making its annual report of its year's operations, the Import Committee of the American Paper Industry announced that during the last year it handled 583 separate problems, involving over 1,000 importations of paper which were believed to be in violation of the tariff law. During the year decision was reached in 479 cases, and 288 of these decisions were favorable to the position of the Import Committee. Since the Committe was formed, there have been over 5,000 importations investigated in which there was reason to suspect evasion of the tariff law, and of the cases decided a very large proportion has been favorable to the position taken by the paper industry through the Import Committee.

During the year some most vital test cases were decided by the Customs Courts. Of these, the decisions of the United States Court of Customs and Patents Appeals in the so-called Heffernan and Side-Run News cases can be listed as decisions which would alone justify the entire expense of the Import Committee in its five years of activity. The decisions in these cases, involving judicial determination of the meaning of the words "standard news print paper" in the free list provision of the Tariff Act of 1922 and indirectly of the definition of standard news print promulgated as a result of the Import Committee's efforts in 1925, although that definition is not directly approved or disapproved, definitely restrict the importation duty free as standard news print paper to kinds of paper chiefly used by newspapers whether in composition, characteristics or dimensions.

Another important decision involved the application of 10 per cent additional duty on writing papers which are decorated or given a special finish, and literally hundreds of importations now pending in the Customs Courts are affected by this ruling. This ruling requires the payment of the 10 per cent duty on writing papers which are tinted, or which are given a decorative effect, even though this effect is not produced by secondary processes in the treatment of the basic paper.

C. W. BOYCE APPOINTED SECRETARY

Charles W. Boyce, formerly of Rochester, N. Y., was elected secretary of the American Paper and Pulp Association at today's convention, to assist General Manager Jesse H. Neal in the management of the association's activities, and was also elected secretary-treasurer of the Woodlands Section of the association, the section composed of the technical foresters in the employ of the paper mills. Mr. Boyce, after graduating from the Forest School of the University of Michigan at Ann Arbor, Mich., was in the United States Forest Service until about a year ago when he was put in charge of the Woodlands Section work, and later made acting secretary of the association. When with the United States Forest Service Mr. Boyce was stationed at Washington in charge of economic forestry investigations in the paper industry.

FOREST PRODUCTS LABORATORY

R. H. Laftman, chairman of the advisory committee to the Forest Products Laboratory, presented the following report:—

Your Advisory Committee to the Forest Products Laboratory has held two meetings at which members of the Laboratory staff presented in detail their progress on projects already approved and their program for the current fiscal year. The committee gave enthusiastic approval to the work accomplished and especially commended the way in which the program has been conceived and focused upon the practical problems of the industry. A few minor changes in arrangement of the program were recommended, however.

Your committee has also kept in close touch with all the details of the work on the Association Fellowship and believes the progress already made practically guarantees future results of far-reaching importance to all phases of the paper and pulp industry, if this work receives continued support over a long enough period.

Your committee has recommended to the Forest Products Laboratory the establishment of a short course in alkaline pulping processes similar to the sulphite courses given in the past.

BAG COUNCIL FORMED

A meeting o the newly formed bag council was held Monday afternoon, February 17, at the Hotel Pennsylvania, with six representatives present, including the manufacturers of bag paper, the converters of paper in the manufacture of bags and companies which both produce the paper and the finished bag.

The members of the council are as follows: H. W. Ellerson, Albemarle Paper Company, Richmond, Va.; C. R. McMillan, Union Bag and Paper Company, New York City.; P. M. Tallon, Hummel-Ross Fiber Company, Hopewell, Va.; E. E. Brown, Lawrence Bag Company. Middletown, Ohio.; Alfred Bleyer, Alfred Bleyer Company, New York; J. N. Harvey, Advance Bag and Paper Company, Boston, Mass.

This council is formed in the effort to eliminate any misunderstanding between the three groups and to coordinate the three different types of companies involved in the production of paper bags.

WRITING PAPER MANUFACTURERS

At the 69th annual meeting of the Writing Paper Manufacturers Association, held on Wednesday, February 19, at the Hotel Pennsylvania, Colonel B. A. Franklin, of the Strathmore Paper Company, Mittineague, Mass., was elected president for the ensuing year. The following officers were elected to serve with him:

Vice-Presidents: G. S. Morse, Valley Paper Company, Holyoke, Mass. and C. B. Clark, Riverside Paper Corporation, Appleton, Wisconsin.

Secretary-Treasurer: E. H. Naylor, 44 Vernon street, Springfield, Mass.

Executive Committee: Colonel B. A. Franklin, chairman; G. S. Morse; C. B. Clark; A. C. Gilbert, Gilbert Paper Company, Menasha, Wis.; H. W. Hixon, Chapin & Gould Paper Company, Springfield, Mass.; W. R. Howard, the Howard Paper Company, Urbana, Ohio; E. A. Oberweiser, Whiting-Plover Paper Company, Stevens Point, Wis.

KRAFT PAPER COUNCIL

The newly organized Kraft Paper Council met at the Hotel Pennsylvania, Monday, February 17, with all five representatives each of the manufacturers and merchants present. The council was organized to discuss mutual problems of merchandising, and to take all possible steps toward the development of a broader market for kraft paper, as well as to put both the producers and distributors in an organization that can act for the good of the entire industry on problems of mutual interest. H. W. Ellerson of Richmond, Va., of the Albermarle Paper Company., is chairman of the manufacturers group and J. C. Mallalieu, of New York, of George W. Millar & Co., is chairman of the merchants group.

NATIONAL KRAFT MANUFACTURERS

The National Kraft Paper Manufacturers Association, after two days of discussion of program, has laid out preliminary plans for the organization of one of the strongest trade associations in the paper industry to include mills in the North East, South and West. Officers elected were as follows:

President, Col. A. C. Goodyear, Bogalusa Paper Company, Bogalusa, La.

Vice-President, T. P. Schnorbach, Filer Fibre Company, Filer City, Mich.

Manager, O. M. Porter, New York.

Executive Committee, Col. A. C. Goodyear; T. P. Schnorbach; H. A. Sheesley, Continental Paper and Bag Company, New York; N. S. Stone, Mosinee Paper Company, Mosinee, Wis.; S. L. Bittner, Central Paper Company, Muskegon, Mich.; R. A. McDonald, Crown-Zellerack Corporation, San Francisco, Cal.; John E. Alexander, Nekoosa Edwards Paper Company, Port Edwards, Wis.; and H. W. Ellerson, Albemarle Paper Company.

The association presented J. P. Hummell with a silver placque in recognition of his services in organizing the association and his services as its first president.

AMERICAN WAXED PAPER ASSOCIATION

Several enthusiastic meetings were held during the Convention by the American Waxed Paper Association.

In addition to the general meetings of the association, five group meetings were held and constructive programs adopted by each group.

The following officers were elected for 1930-1931:

President, W. J. Eisner, Newark Paraffin and Parchment Company.

Vice-Presidents, W. L. Carter, Bread Wrapper Group; L. H. Croy, Household Rolls Group; B. H. Ballard, Glassine Group; E. W. Keeley, Tissues Group and A. Havemeyer, Confectionery Papers Group.

Manager-Treasurer, Paul S. Hanway.

Counsel, Davies, Jones & Beebe.

COVER PAPER ASSOCIATION

At the 57th Annual Meeting of the Cover Paper Manufacturers Association held on Tuesday, February 18, at the Hotel Pennsylvania, New York City, the following officers were re-elected for the ensuing year:

President: Colonel B. A. Franklin, Strathmore Paper Company, Mittineague, Mass.;

Vice-President: J. B. Shepherd, Peninsular Paper Company, Ypsilanti, Mich.;

Secretary-Treasurer: E. H. Naylor, 44 Vernon street, Springfield, Mass.;

Executive Committee: Colonel B. A. Franklin, chairman; J. B. Shepherd, and W. H. Howes, Knowlton Brothers, Inc., Watertown, N. Y.

GUMMED INDUSTRIES ASSOCIATION

"If your organization will develop new uses for your commodity you will have great opportunity for an increased market." said Irving Feldner, publication director of *System* before the Gummed Industries Association. "I myself have a fad of building model ships, and I make them by pasting together strips of gummed paper tape."

The association elected the following officers:

President, W. K. Gerbrick, Central Paper Company, Menasha, Wis.

Vice-President, L. A. Bassett, McLaurin-Jones Company, Brookfield, Mass.

Secretary-Treasurer, Douglass A. Crocker, 18 East 41st street, New York.

TISSUE PAPER ASSOCIATION

At the annual meeting of the Tissue Paper Manufacturers Association, held at the Hotel Pennsylvania on Tuesday afternoon, the following officers were elected:

President, A. E. Cofrin.

Vice-President, M. L. Dinkelspiel.

Secretary-Treasurer, Herbert Thwaite.

Executive Committee, T. B. Wheeler and B. F. Picola.

The offices of the association are now located in new quarters at 280 Madison avenue, New York.

SOUTHERN KRAFT ASSOCIATION

The Southern Kraft Manufacturers Association held their annual meeting on Wednesday, at the Hotel Pennsylvania.

There was an excellent attendance at both meetings and many discussions of business developments by members of these groups proved highly instructive.

Members of the association were agreeably surprised by the presence of Secretary-Treasurer C. E. Dobson, who had only recently been discharged from a hospital following a serious operation.

NO. 1 KRAFT TAPE COMMITTEE

The Standing Committee on No. 1 Kraft Tape discussed the developing market for gummed tape in the shipping field, and emphasis was placed on the need for the maintenance of a high quality of tape. The use of the better grades of tape is recognized as important in the insuring of tape sealed containers against damage in transit. It is found that properly sealed containers are in increasing demand.

JESSE H. NEAL'S ELECTION CONFIRMED

Jesse H. Neal, formerly a St. Paul newspaper man was formally elected general manager and treasurer of the American Paper and Pulp Association on Thursday, confirming a temporary election made a few months ago by the executive committee of the organization. Mr. Neal has had a long record of successful work in the trade association field, particularly with the Associated Business Papers, Inc.

PAPER BAG INSTITUTE

A new organization to be known as the Paper Bag Manufacturers Institute was created at a meeting in Parlor A of the Pennsylvania Hotel, on Tuesday. Ideas for the furtherance of group work and greater co-operation were put forth by the various members present.

CARDBOARD MANUFACTURERS

A meeting of the Cardboard Manufacturers Association which took place on Wednesday at the Hotel Pennsylvania, was attended by a large group of members, and an interesting general talk on problems pertaining to the development of the association's business was the feature of the occasion.

NATIONAL KRAFT PAPER LUNCHEON

The National Kraft Paper Manufacturers Association members met at their annual luncheon on Wednesday at the Hotel Pennsylvania. Following the event a general presentation of business news was participated in by those present.

SULPHITE WASTE LUNCHEON

The Sulphite Waste Utilization Sub-committee met at luncheon on Wednesday on the roof of the Hotel Pennsylvania for a complete survey of conditions and new approaches to old problems for the coming year.

PAPER BAG INSTITUTE DINNER

The Paper Bag Manufacturers Institute met at dinner on Tuesday evening, for the friendly discussion of plans for the coming year. This function was held at the Hotel Pennsylvania, and all present agreed that it was a most enjoyable event.

U. S. PULP PRODUCERS ASSOCIATION

The United States Pulp Producers Association met on Tuesday afternoon and decided to dissolve and to arrange with the American Paper and Pulp Association to compute statistics in more complete form than has been done in the past.

TECHNICAL ASSOCIATION MEETS

Fifteenth Annual Convention of the Technical Association of the Pulp and Paper Industry Is Held at the Pennsylvania Hotel, New York

M. A. Krimmel, of the Hammermill Paper Co., Erie, Pa., Is Elected President—Reports of the Officers Show that the Association Has Greatly Increased Its Activities During the Year—Section Is Formed on the Pacific Coast and Other Sections Will Probably Be Formed Soon—Membership Is Largest In Its History, Totaling Almost 1100 and Includes Every Representative Paper Making Country in the World.

THE fifteenth annual convention of the Technical Association of the Pulp and Paper Industry was held at the Pennsylvania Hotel February 17-20. Representative technical men from all over the United States and Canada were present and the meeting was a big success in every respect.

ADDRESS OF PRESIDENT GLATFELTER

It is a great pleasure to welcome the members and friends of the Technical Association of the Pulp and Paper Industry to our fifteenth annual meeting. We have a double purpose while we are gathered here in mutual exchange of knowledge and good will, to review the developments of the past year, and to build plans for future progress. We believe that we have made substantial progress in 1929. Not only have we strengthened our forces by adding new members, but also have we increased the surplus in the treasury, both of which have aided in greater technical progress.

The growing prestige of our association has been international. Valuable contacts have been formed not only in our country but in all the countries of the world. From foreign nations new members have been recruited and have sought membership. Our roster now includes not only executives, managers, superintendents, engineers, and chemists in the industry, but also technical men from allied industries which supply us with equipment and materials, individuals engaged in or interested in the application of technology to the manufacture of Pulp and Paper.

Committee Personnel

With this increasing membership the association must be kept on a high plane. New members for our various committees must be carefully selected, as the life of this organization depends upon the personnel of its standing committees, no other function being of more vital importance than committee activity. I want to thank the committeemen for their fine work during the year just past, for the unselfish giving of their time to their work, and for the record they have held in compiling valuable data pertaining to all phases of the manufacture of pulp and paper. This data must be kept up to date and added to constantly. It is my sincere wish and charge to all association members that as years go on and as our work becomes more strenuous the enthusiasm of our committees will not relax, but continue to be the chief factor in building a still stronger organization.

The Technical Association can become even more powerful through the activity of sectional organizations. We are about to vote upon certain changes whereby territorial groups of TAPPI may be formed. These can serve as valuable feeders to the membership and work of the national association. You have heard of the Pacific Coast Section. It is not yet quite nine months old and today has a membership of 75, a fine illustration of what a section can do. I would suggest that you refer to the October and November trade papers in which the splendid first meeting was given considerable mention.

It might be well to review the by-laws governing sectional organizations. For one to be formed an application signed by three TAPPI members must be submitted to the executive committee for approval. The officers must be members of TAPPI. The group must be self-supporting a certain per cent of the dues of a TAPPI membership being refunded to help meet running expenses. A splendid opportunity is now available for interesting mill men and helping them obtain a clearer in-

M. A. KRIMMEL, PRESIDENT

sight into technical matters through the affiliated membership in a Section Organization.

Last year your executive committee sponsored a fellowship at the Forest Products Laboratory. We agreed to set aside $1,000 annually for three years to be used for research work, with the understanding that the remaining funds necessary for carrying on such work were to be provided by the American Pulp and Paper Association. The details relative to the administering of the research program are to be left in the hands of the American Pulp and Paper advisory committee. We are glad to report that the Forest Products Laboratory has made excellent progress in determining the physical laws governing the relation between the structural strength of the sheet and the percentage of solids by volume in the sheet. From the work that is now being conducted it may be possible in the future to tell from pulp in suspension what the properties of the paper will be.

I want to take a minute here to call attention to the Institute of Paper Chemistry under the direction of Dr. Otto Kress. This institute has been formed to meet the problem of training chemists so as to fit them especially for the paper industry. It has been made possible by such men as Ernst Mahler, D. Clark Everest, Hugh Strange, L. M. Alexander, D. K. Brown, M. A. Wertheimer, and the cooperation of Dr. H. M. Wriston, President of Lawrence College, Appleton, Wis. This institution is so situated that the student will have easy access to the many mills in this wonderful paper making district. In addition to the undergraduate work the institute offers a post graduate course. Needless to say our industry is indeed fortunate to be so well fortified for the supplying of capable men in years to come.

TAPPI Special Reports

The Service to Members Reports during the year have been of very high quality. Generous contributions of valuable information have been made. Many of us can acquire this valuable data by showing a willingness to contribute information to the questionnaires sent out from time to time. It must be remembered also that only those who contribute to these reports are entitled to receive the information given by others.

During the coming year we should like to see more progress made in improving our method for the evaluation of pulp quality, and in our method of paper testing.

Summary

In conclusion let me review the things that are necessary and important that our association accomplish.

First: We must strive for an increased membership, especially among mill superintendents and engineers.

Second: We must develop stronger committee and sectional organizations.

Third: We must better our Service to Member reports by every one cooperating in supplying data.

Fourth: We must complete satisfactory methods for the evaluation of pulp quality and paper testing.

For each member individually, I would say that it is important that the prestige of TAPPI be maintained. This cannot be done by the explosion of high sounding vocabulary, dressed up with chemical formulas, but by practical and workable methods. As years pass we can look back upon many important changes in our industry. But we must not take too much time in looking back. In the pulp and paper industry there is a fertile field ahead, and TAPPI must play its part.

REPORT OF SECRETARY MACDONALD

The year which terminates with this meeting has seen the Technical Association continue to make progress particularly in membership growth, financial strengthening and internal organization.

Membership

There were 194 members elected in 1929 which is an increase over any previous records. On December 31, 1929 our total membership was 1,033 of which there were 666 Active members, 265 Associates and 102 Juniors. 63 were dropped or resigned from our membership, including three members who died. Our Corporate membership was increased by 21 paper companies, thereby making our Corporate membership 89. An interesting feature of our growth in 1929 was its international aspect. A large number of the new members reside in Canada, Great Britain, Sweden, Norway, Finland, Germany, France, Italy, Switzerland, and Russia. The technical organizations in most of these countries have extended an invitation to the members of TAPPI to join their organizations.

Special Reports

Manufacturing and other technical problems of individual and company members have been received and presented to the entire membership for consideration. In this way the original plan of the Association to be a clearinghouse for the exchange of information is encouraged. Aside from Corporate members, only members who contribute information are eligible to receive the compiled transcript of replies.

It is interesting to note particularly in the case of some of our Corporate members that the inquiries sent out by TAPPI are distributed to the superintendents and others in the mills qualified to report on the subject. The replies are then edited and a composite company report is delivered to the Association. It is evident that the reports are stimulating investigations in many mills inasmuch as the problems outlined in the inquiry cannot be solved by any simple formula. The joint contributions from executives, superintendents, engineers and chemists provide ideas and records of experience from a wide field of technically trained men.

Following are the titles of the Special Reports issued in 1929:

1. No. 114—Strength and Opacity in All Rag Sheet.
2. 115—Board Machine Felts.
3. 116—Corrosion Resistant Agitator Shafts.
4. 117—Paper Board Deckles.
5. 118—Coating Paper to Get High Folding Test.
6. 119—Accomplishments of Technical and Research Departments.
7. 120—Dusty Cement Floors.
8. 121—Yankee Machine Drier Surfaces.
9. 122—Circulation in Beaters.
10. 123—Machine for Making Light, Soft, Absorbent Sheet.
11. 124—Wrinkles in Light Weight Paper Rolls.
12. 125—Suction Box Marks on Paper.
13. 126—Extraction of Particles from Stuff.
14. 127—Woolen Paper Machine Felts and Algae.
15. 128—Corrosion of Stuff Preparation Equipment.

Fall Meeting

A well attended and well arranged meeting of the Association was held at Richmond, Virginia, on September 24-27, 1929. Under the able chairmanship of B. K. Steadman, chief chemist of the Standard Manufacturing Company, the local committee prepared and conducted one of the best meetings the Association has ever held. Complete details of the meetings, its location, committee personnel, mill visits, and program were published in the trade journals of September and October.

Contributing Members

At the last annual meeting it was voted to add a new class of members, namely companies not engaged in the manufacture of pulp and paper, but who were vitally interested in the welfare of the pulp and paper industry. No effort was made to build up this group but within the past few weeks an invitation was sent to a few companies to join, with us, and the response has been excellent.

Joint Enterprises

TAPPI has cooperated with several organizations during the year. It is represented with the A. P. P. A. and the Superintendents Association on the Joint Educational Committee of the Paper Industry. Our Power and Mechanical Engineering Committee is working with The Hydraulic Society in consideration of the loss in head due to friction of pulp flowing through pipes.

A meeting was held at the Chemical Equipment Exposition at which several exhibitors read papers. TAPPI is represented with the A. P. P. A. and the Association of Wood Pulp Importers on the Joint Committee on Approved Pulp Testing Chemists.

Chicago Century of Progress

A committee consisting of Allen Abrams, chairman, R. A. Hayward, H. G. Ingraham and W. G. MacNaughton was appointed by the President to cooperate with the Science Advisory Committee of the National Research Council in working out a plan of exhibit for the paper industry at the Chicago World's Fair in 1933.

American-Scandinavian Foundation

TAPPI has again assisted the American-Scandinavian Foundation in its work. Messrs. Overwien of Norway and Humble and Sundell of Sweden have completed a period of service in American mills and have returned to the Scandinavian countries. The Container Corporation of America, Bird & Son, and Crocker-McElwain Company have kindly cooperated in these endeavors.

John F. Ohlson formerly of the Cornell Wood Products Company, and Edwin C. Jahn of McGill University were sent to Holmens Bruks A/B in Sweden. William F. Gillespie of Bogalusa is now with Kramfors A/B and Keith Gainer of the International Paper Company, spent some time at Kemi A/B in Finland. These cooperative efforts have been found to be mutually beneficial.

Employment

By conducting an employment exchange the Association has endeavored to keep its members employed. It is hoped that the Secretary's office may be utilized even more as an employment clearinghouse. No charge is made to companies or individuals for this service.

Committee Activities

To encourage more intensive consideration of technical problems, particularly as they relate to the mills in certain localities it is felt that an Association policy regarding sectional organization and administration should be formulated. The necessary changes in the Articles of Organization have been given publicity and will be voted on at this meeting.

RONALD G. MACDONALD, SECRETARY

Pacific Coast Section

A section made up of the members of the Technical Association on the Pacific Coast was officially organized in June 1929. This organization should be highly successful and will eventually have the wholehearted support of all the companies of the Coast.

Publications

Early in the year C. J. West's Bibliography of Paper Making 1900-1928 was published for the Technical Association and copies have been purchased by several mills. The reception of the book has, however, not been as great as anticipated and more than half the issue remains unsold. The cost of the book is low and should be in the library of every paper mill and papermaker.

It is a remarkable piece of work and is entitled to greater recognition than it has thus far received.

Technical Association Papers was published in May as Series XII. In many ways it was improved mechanically. In all of its publishing efforts the Association is indebted to the Lockwood Trade Journal Company, and particularly to Henry J. Berger, editor of the PAPER TRADE JOURNAL, for attending to many of the details involved.

Forest Products Laboratory Fellowship

In conjunction with the American Paper and Pulp Association, TAPPI contributed $1,000 to finance a research fellowship at the Forest Products Laboratory at Madison, Wisconsin. The project being worked upon is designated under the general title of "The Relation of Sheet Properties to Fiber Properties through Sheet Structure;" Mr. Randall H. Doughty has been appointed to work under this fellowship.

Committee Activities

In some respects our committee activities have improved during the year. Several features of this phase of our work are interesting. Three committees, namely those on corrosion and alkaline pulping processes and physical standards for pulp, have conducted surveys and collected information of value. The Alkaline Pulping Processes Committee is covering the field formerly handled by the committees on soda pulp and sulphate pulp while the committee on physical standards is studying the problems of pulp evaluation for strength which was previously considered by the sulphite pulp committee.

The Paper Testing Committee prepared revised methods for estimating fiber, paraffin and starch in paper. The proposed changes were favorably voted on by the Association, thereby making them official paper testing methods of TAPPI.

A special committee on permanence and durability was appointed by the President to review the work being done generally toward the solution of this problem and to prepare a report on this subject that will have the unanimous approval of the committee members.

Many of the other committees have been doing good work as will be made evident in the meetings that will be held this week. It is hoped that the quality of committee work will continue to increase so that each year's work may show definite accomplishments.

With regret we mention the names of three of our members who have died during the year, namely, R. D. Bertschy, president of the Miamisburg Paper Company; C. F. Sammet, chief chemist of Crane & Co., and O. S. Egan, technical director of the Consolidated Water Power and Paper Company.

The Secretary has enjoyed the wholehearted cooperation that a large number of members have given him during the year. Without this assistance the work of the Association would be materially hampered.

TECHNICAL ASSOCIATION OFFICERS

President, M. A. Krimmel, Hammerill Paper Company, Erie, Pa.; Vice-President, R. H. Laftman, Bogalusa Paper Company, Bogalusa, La.; R. G. MacDonald, Secretary-Treasurer, 18 East 41 Street, New York.

Executive Committee: for three years, Joseph Slater, Escanaba Paper Company, Escanaba, Mich.; W. O. Johnson, Strathmore Paper Company, Woronoco, Mass.; for two years, C. C. Heritage, Oxford Paper Company, New York.

COMMITTEE ON STATISTICS

C. B. Morgan, chairman presented the following report for the committee on statistics:—

During the past year your Committee on Statistics has cooperated with the U. S. Department of Commerce and with the Advisory Committee to the Bureau of the Census in preparing schedules, for the biennial census of manufactures to be conducted in 1929. The Committee went on record as opposing the addition of questions on the schedule which would not furnish the manufacturers with data of specific value in return for the added work of preparing the schedule.

Your Chairman suggests a change in the personnel of the committee to include more executives. It is felt that this change would be helpful not only in the development of more comprehensive statistical reports, but also in increasing the number of reporting mills and in obtaining more general and correct use of Association reports in the formulation of company policies.

VOCATIONAL EDUCATION

J. Norman Spawn, Chairman, presented the following report for the Joint Committee on Vocational Education of the Pulp and Paper Industry:—

The Joint Committee of Vocational Education of the Pulp and Paper Industry as a result of its investigations which were reported to this Association at the last Annual Meeting, submit for your approval the following suggestions:

1. That a study be made of the possibility of developing a training program for the employees of the members of the American Paper and Pulp Association.

2. That a suitable appropriation be made to conduct this study.

3. That if a training program can be found which is feasible, to then make this work part of the Association's activities.

4. That a complete report of the results of this study be made at the next Annual Meeting in February 1931, at which time definite action can be taken by the American Paper and Pulp Association.

5. That a competent person be employed to make this study under the direction and supervision of the General Manager of the American Paper and Pulp Association.

THE BUREAU OF STANDARDS

Bjarne Johnson, chairman of the advisory committee of the Bureau of Standards, presented the following report:—

Your Advisory Committee to the Bureau of Standards was appointed with the purpose of cooperating with the Bureau in a study of the permanence qualities of paper.

It has not been possible for your committee to meet in Washington during the past year. But individual members have, on several occasions, visited the Bureau and your committee is informed of the progress of their work up to the present time and the plans for the future.

Since the first preliminary publication by the bureau dealing with this subject, the work has been extended considerably so that at the present time six persons are engaged directly in this work and several are more indirectly associated with this study.

A number of new methods of analysis and tests have been included in the working plan and special equipment is being installed to carry out these tests.

Your committee is of the opinion that adherence to the present working plan will result in a better understanding of the factors influencing the permanence of paper and ultimately enable the Bureau of Standards to perfect one test or a combination of tests by which it will be possible to estimate the degree of permanence of various types of paper.

The Bureau of Standards has expressed to your committee the desire of closer cooperation with the Paper and Pulp Industry in all problems relating to this industry and has requested that a General Advisory Committee be appointed for this purpose by the Paper and Pulp Association.

LAKE STATES EXPERIMENT STATION

D. C. Everest, chairman of the advisory committee to the Lake States Forest Experiment Station presented the following report:—

The individual members of the Advisory Committee to the Lake States Forest Experiment Station have followed the work of the Station with interest during the past year. Early in the year each member received a copy of the tentative program of forest research which the Experiment Station proposed to undertake. The advice of the committee members was used in the final selection of new research activities for the year.

Your committee believes that the work of the Lake States Forest Experiment Station is being ably directed. It has been under way long enough now to produce results which are of material assistance not only to paper companies in the Lake States but to those situated in other spruce and hemlock regions. Your committee urges the members and the officers of the American Paper and Pulp Association to support requests for increased federal appropriations for research such as is being conducted at the Lake States Forest Experiment Laboratory in the firm belief that by so doing the sound information so urgently needed as a basis for management of pulpwood lands, will be accumulated and made available to the owners of pulpwood lands.

HEADS SHIPPING CASE COMMITTEE

J. D. Malcolmson, Division of Design, Robert Gair Company, New York City, has been appointed by the American Society for Testing Materials, Chairman of Sub-Committee on Fiber and Corrugated Shipping Cases. This is a sub-committee of Committee D-10, which is in charge of standard specifications of all types of wooden, metal or paperboard containers.

Recently there has been felt a need for a revision of the container specifications and Committee D-10 will form a common meeting ground for all competitive and non-competitive interests to work out advancements in shipping containers. The Society also feels the need for developing nomenclature with definitions of terms used by shippers and the container industry, methods of test, standards of quality of materials and methods of measuring dimensions.

Technical Association Papers and Reports

Presented at the Annual Convention of the Technical Association of the Pulp and Paper Industry at the Pennsylvania Hotel, New York, February 17-20, 1930—Representative Men of the Pulp and Paper Industry Discuss Numerous Important Problems of Timely Interest.

Light, a New Measuring Rod for Paper*

By Frederick A. Pearson[1]

It is a long cry from the fourdrinier to the photo-electric cell of modern physics. And yet it is no such journey as that from the old Rittenhouse Mill at Germantown to the plant of the modern maker of paper. In former times the industry had to wrestle with the inertia of tradition, the dogged refusal to improve until the economic laws of competitive business automatically removed those who would not change. In the present day the industry is awake to entertain any suggestion for improvement, in any department of the industry.

It is due to this modern alertness that various arts and sciences are becoming interjoined. To make paper, the chemist and chemical engineer must collaborate with the mechanical and electrical engineer, and, as the need to eliminate waste in the industry becomes acute and the maker's pride in the excellence of his product becomes a more vital force, paper makers are looking beyond the limits of their particular art and are asking for better means by which to measure and evaluate their products.

It is from the newer arts that such means must arise. One such modern art is that embodying the use of photo-electric cells, amplifying tubes and the kindred discoveries of the 20th century physicist. This art, in which I have been a student for the past six years, I can not properly name. It is electrical, yes, and optical. It is not to be confused with radio engineering, since radio treats of alternating current phenomena, while this art equally uses direct current effects. It must be a thousand times more precise than radio, in that ordinary radio apparatus need not bother to eliminate the many variables that occur in the electrical values of the elements used. For lack of a better name I shall call it "the art of measurement by electron emission apparatus."

I shall today try to make clear the correlation which I believe exists between this art and your art of paper making, with especial reference to the instrument called the Opacimeter, or meter of opacity, which has been applied directly to the paper machine.

Fundamental Principles

Before discussing the specific development, I should like to take a moment to point out in its general aspects the possibilities of vacuum tubes applied to your industry. You are doubtless familiar with numerous instruments available on the market for measurement of hydrogen ion concentration. These instruments function with a weak current in terms of thousandths of an ampere. By the use of the amplifying system developed for the Opacimeter currents one millionth of these can be measured and recorded. You have probably seen coin counters or similar photo-cell developments which function by applying a beam of light to a photo electric cell. Such commercial developments as are in use to date use either the change from full light to no light, or coarse graduations in the value of light applied to the photo cell. The Opacimeter functions with the practically imperceptible change in a weak light caused by the increase or decrease of, say, one-eighth of a pound in twenty pound paper. We have thus a measuring rod of enormously increased sensitivity, and the possibilities of the application of this rod to industry are bewildering. It opens up a field of precise measurement so great that no one man nor group of men can cover it practically for years to come.

The specific adaptation of this circuit to paper measurement resulted in the development of the Opacimeter. It was required to make an instrument which might be mounted upon the paper machine when in service to measure the variations in the weight of the paper in process. It was obvious that heavy paper would occlude more light than lighter paper. If, then, a photo-cell could be mounted on one side of a sheet of moving paper and a light of constant value directed toward the cell on the other side of the paper, and if the resulting effect on the cell could be amplified and brought out to a recording mechanism, it seemed possible that information previously lacking could be given the paper maker about his product before it had left the paper machine.

The first part of this development consisted in devising an amplifying system which was truthful. This was accomplished by the use of a new balancing circuit using two vacuum tubes such as are used for radio amplification. By this circuit errors inherent in the tubes were cancelled against each other.

Next, experimentation was required to determine under what conditions a photo-cell could be depended upon to function with constancy.

The development of a system to maintain constant light proved to be a third problem, as any variation in the source of light coming through the paper to the cell would inevitably result in an apparent variation in the paper. This was finally overcome, and the voltage of our light is held to a variation of not more than one hundredth of a volt, so that the light energy given out is to all intents and purposes constant over a long period of time.

Application to Paper Machine

When finally perfected electrically, the Opacimeter was tried out on a paper machine, placing the photo cell under the paper at a point after the paper had been dried but before it was sized, and placing the light above the cell. The cell and light could together be moved about one foot in from the edge of the moving sheet of paper.

This arrangement was found to give much valuable information regarding the varying weights in the sheet. But it was immediately apparent that to give the ultimate of information the Opacimeter had to be so arranged that the cell and light could be moved

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 18, 1930.

[1] Member TAPPI; Director, Pearson Research Laboratories, Great Barrington, Mass.

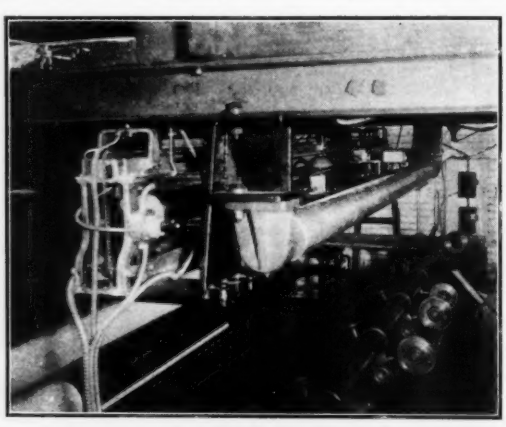
across the paper machine and back, which would enable the comparison of one strip of the total web with another.

Accordingly we set about the mechanical design to make such a mobility possible. This new design comprised tracks above and below the paper in process; on the lower track is the carriage containing the photo cell, and on the upper track the light is carried. The paper in process passes between the tracks. When the carriages are out on their tracks, the paper in process just brushes a crystal on the top of the photo cell box, thus maintaining the exact distance from the paper to the cell.

The movement along their tracks of the light and cell is effected by a chain drive, which keeps the light directly above the cell window. As an electrical control of this movement was required, without the interposition of clutches or other unprecise means of engagement, a gear shifting mechanism was built to shift its own gears using only a small solenoid for control. Thus the movement of the carriages can be controlled either automatically from track switches, or else by push button contacts from the control cabinet. Engineers mechanically inclined will find a description of this electrical gear shift in the last October number of the magazine "Machinery."

At the back end of the tracks, which is also the back of the paper machine, there is a home position for the carriages. At this point there is provided a support for a sample sheet of paper. When the carriages are in their neutral position, the light shines through this paper, and to start with the operator balances the cell against this sample. This means he must turn the balancing dial one side or the other, which brings the pen of the recorder to the middle or zero point on the recorder paper.

When properly balanced, the operator touches the "advance" button. The gear shift picks the forward speed and the carriages move out on both sides of the moving web of paper in process, and the record of the web begins. The carriages are arranged to move across slowly, in about 18 minutes, but to return quickly, in 30 seconds, for a new journey. Immediately the cell is under the

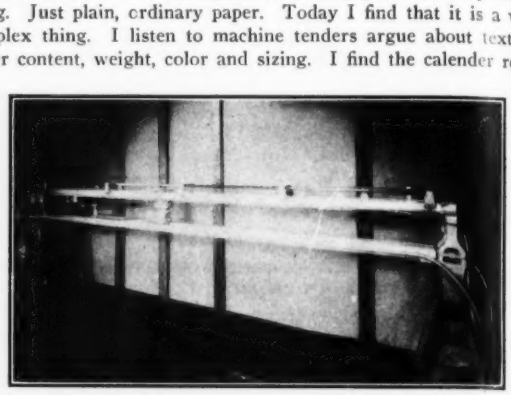


TRACK ASSEMBLY OF THE OPACIMETER

Mounted on the paper machine above the drier rolls. The cell and its spot light shown in the circle. Toward the rear of the machine may be seen the gear shift box which permits of control of the motion of the carriages from the control cabinet.

moving web, the recorder shows the difference, over or under, of the moving web compared to the sample. This can be calibrated in pounds. As the carriages continue across the moving sheet, the recorder writes a record of the weights of the various strips crossed. On arriving at the front side of the machine, the upper carriage contacts a reversing switch and the carriages return to a starting position on the moving web, and thus move back and forth across for the duration of the run. If the operator wishes to again check against the sample, he throws the switch to the so-called "Home Position" and the carriages go back to the sample, and remain there with the gear shift in neutral.

It is now pertinent to ask "What does the light measure?" First let us discuss what there is about paper that requires measurement at all. Two years ago I looked at paper as a fairly simple thing. Just plain, ordinary paper. Today I find that it is a very complex thing. I listen to machine tenders argue about texture, water content, weight, color and sizing. I find the calender room



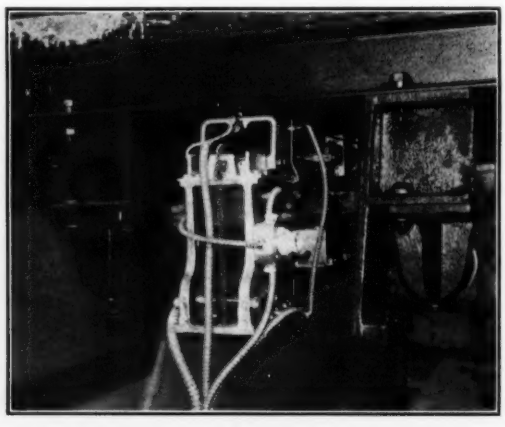
TRACK ASSEMBLY OF THE OPACIMETER

In the shop previous to mounting on the paper machine. The small, rectangular box contains the photo-cell, and a spot light is carried upon the upper tracks directly over it. The web of fabricated paper will pass between.

superintendent very much concerned over the matter of tension and roll surfaces. I find that there are many things that can not be measured in paper manufacture, and that should be measured.

Let me enumerate some of the elemental problems as they appear from the viewpoint of an "outsider looking in." Confining our attention solely to the fourdrinier, and its attendant drying and sizing bath we shall consider the fiber that comes to the wire. Any of the things I shall mention may cause variation in the entire web or in streaks of it.

The fiber may vary in quality or size of particles or in color or



TRACK ASSEMBLY OF THE OPACIMETER

Mounted on the paper machine. Here the web is in motion between the light and the cell. The carriages are at the front of the machine. The empty light socket ordinarily holds a pilot lamp which lights each time the carriages come to the end of the tracks and reverse. This informs the machine tender that a cycle of measurement is ended.

density as it flows from the head box to the machine. It is apt to vary from one beater to another. Its distribution in the water carrier may vary, and its flow to the machine may not be even.

As the fiber suspension settles on the wire, its distribution may be affected by eddies at the edges, or eddies at the slice, or uneven regulation of the slice. The interlocking may vary, due to causes mentioned above or to change in the shake. As it leaves the wire immediate handling of the paper is going to affect it, depending on the felt treatment. The tension on it, when drying, is going to change it. The temperature of the size and duration of sizing, of course, makes a difference, and the tension of the winding

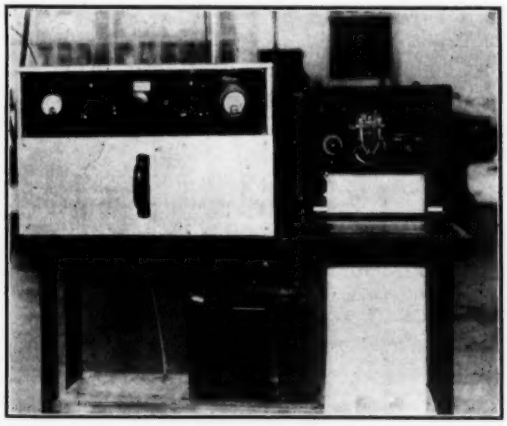
should not be overlooked. What you papermakers want is paper of constant weight, constant water content, constant thickness and certain texture. How to get constancy with all these unknowns is no simple problem.

Now in what way can light assist in the solving of these problems. Can it give you a new yard stick by which to measure your variations? I believe that it can.

The tendency on the part of paper to obstruct the passage of light, or its opacity, is affected by some, but not all, of the variables mentioned. If we can then measure the paper under conditions where all but one variable are eliminated, the changes caused by that variable are going to stick out.

Take the matter of weight for instance. The paper's weight previous to sizing depends practically upon two factors, the amount of stock and the amount of water in the sheet. But water is not opaque. A change of 2 or 3 per cent in moisture content does not affect its opacity, when it is nearly dry. Thus if we get the measure of the opacity of a sheet, and then tear out a sample, dry it a predetermined number of times on the hot roll, and weigh it, we are checking actual mill sample weight against the reading of opacity. We then can be sure that a paper showing the same opacity reading is of the same weight. Two other factors might introduce error. These are color and texture. Our experience has shown that a decided change in either color or texture will affect the opacity and show on the recorder. However, a decided change in either of these is apt to be noticed immediately by the machine tender, and they occur seldom, while changes in weight occur all the time.

Thus, with ordinary attention to the color and texture, any change noticed by the recorder is, 99 per cent of the time, a change in weight. Such changes are particularly apparent when a new beater is turned into the stock chest. To maintain constancy of weight of paper, the fourdrinier must be altered in speed or the flow of stock must be changed, or both. These adjustments can be made directly from the Opacimeter, thus saving time and wastage in getting the machine back to correct weight.



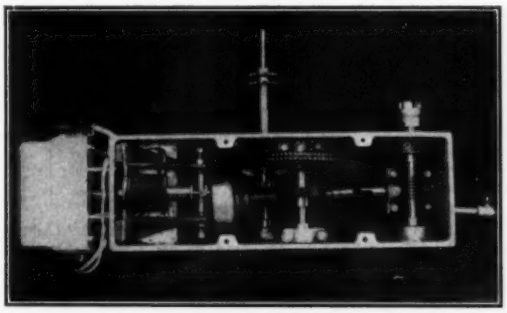
THE CONTROL CABINET OF THE OPACIMETER

By adjusting the center dial on the panel, the machine tender can balance the paper in process against the sample. Then the moving pen of the recorder records the weight of the newly made paper showing its variations across the sheet as well as longitudinally.

One of the most serious difficulties in making fine paper is the avoidance of thin and thick streaks the length of the sheet in process. These can be seen by recurring changes in the pen record, and corrected. The whole sheet may as a whole be the right average weight, but one side may be heavier than standard and the other lighter. This is seen and can be corrected.

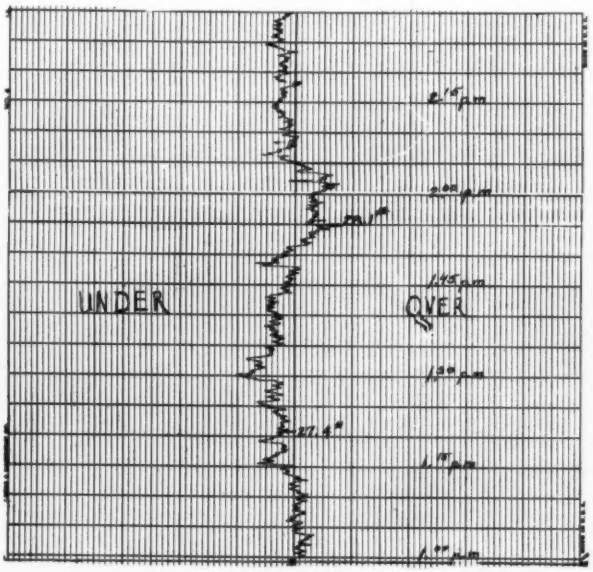
We have then, in this instrument, a means for measuring the weight of paper in process. A record of this weight can be written in any place in the mill; for instance one recorder functions opposite the machine for the guidance of the machine tender, while an executive may have a duplicate recorder functioning in his office giving him a minute by minute story of the operation of the machine.

I am often asked if this instrument can be used for other measurements than weight in the paper industry. We are satisfied that it can, but to what extent we can not say without some further experimentation. For instance in the matter of calendering paper it is of importance that each sheet shall correspond closely in thickness with its neighbor. We find if two sheets of equal weight per ream, but calendered differently are put under the Opacimeter light, if one be say 4/1000ths inch thick and the other 5/1000ths inch thick, a difference in their opacity is noticeable. For the case given, the pen of the recorder would move perhaps onehalf inch from the balanced position, thereby giving a reading of thickness rather than weight.



THE ELECTRICALLY CONTROLLED GEAR SHIFT

which throws its own gears. Here a ratio of 15 to 1 is obtainable between reverse and forward speeds. The solenoid moves a plunger which interrupts the movement of one element of a small planetary system contained in the cup, thus moving the working gears orbitally from one position to another.



RECORD OF STRIP MEASUREMENT

Here the carriages of the Opacimeter were stationary, with the result that the weight of a given strip of the web was measured. The desired weight was 27.5 lbs. per ream. At 1.00 p.m. the weight was running close to standard. At 1.15 p.m. a slight irregularity of stock caused a lighter weight, which the machine tender attempted to correct. At 1.48 this irregularity recurred, and was over-corrected. By 2.05 the machine was brought back close to desired weight. The weights marked were actual sample weights.

In introducing the Opacimeter to the paper industry, we are confident that we are opening a new field in the art of industrial measurement. This is an instrument which can give you information previously beyond your reach, and we have reason to believe that it will eventually take a place in your industry comparable to the micrometer caliper in the automotive industry.

Gradual Temperatures in Paper Drying*

By C. F. Rasmussen[1]

I have recently been studying the process of drying paper by means of a method in which the steam to each drier cylinder and the work done by it is individually controlled and gradual drying is obtained. My study has been based on:

1. An accumulation of tests (some conducted by myself before and after individual drier operation was installed)
2. Investigations of paper drying equipment in actual operation in some of the leading paper mills in the country.
3. Studies of actual drying costs and plant records.

I believe this material which I have compiled in collaboration with some of the leaders in the paper industry contains information which may point the way to a better product and increased profits for many paper manufacturers.

Importance of Drying

The paper industry until quite recently considered the production of steam a necessary evil. A mill was planned to produce paper, not steam. But as fuel costs increased it became necessary to operate the steam plant of a paper mill as efficiently as that of a large public utility.

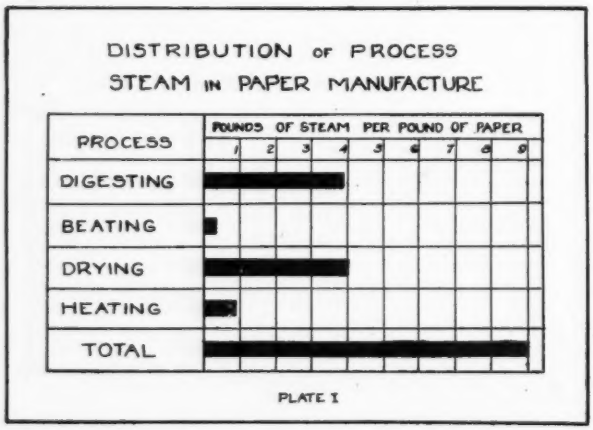


PLATE I

To illustrate this point, let us consider a mill with a single machine producing 50 tons of paper and 50 tons of sulphite a day and producing steam at a total cost of $.40 per 1,000 pounds. We will assume that this mill has sufficient water power for beaters, wood room, etc. Such a mill would require approximately 500,000 pounds of steam per day for the sulphite mill and a like amount for power for the paper machine and for drying. The total annual steam cost amounts to $120,000. It is evident that efficient steam generation will directly affect the cost of steam and decrease the annual cost accordingly.

Second in importance to the generation of steam is its efficient use. A great deal of the savings effected by efficient production are lost if the steam is wastefully used.

Plate I shows the process steam requirements for our typical mill. Out of each 9 pounds of process steam required for each pound of paper manufactured 4 pounds or 4/9 of the total are required for drying. In other words it requires almost half as much steam to dry the paper as for all other processes together.

Now let us consider again the case of the 50-ton machine. At a rate of 4 pounds of steam per pound of paper dried, with steam at $.40 per 1,000 pounds and 300 days operation per year, the annual cost of steam for drying will be $48,000. If the steam required by the drier system be cut by 25 to 33 1/3 per cent the drying cost will be lowered proportionately.

Essentials of Efficient Drier Operation

To obtain the maximum efficiency from the drier section of any given paper machine, it is necessary that:

1. Each drier must be in good condition mechanically, the inlet and outlet pipes, valves and syphons must be in order, and the shell must be smooth and bright with a fairly uniform thickness. The condition of the shell is very important.
2. The drier section must be properly hooded and ventilated.
3. Accumulation of air and water in the drier must be prevented, and steam must not leak through the system without doing useful work.
4. The temperature of the individual driers must be correctly graduated in relation to adjacent driers so that the paper will be dried at the ideal rate as it passes through.

We will assume for the purposes of this paper that the first two conditions are satisfactory, and will deal with the last two only. A number of drying systems have been developed that satisfactorily remove the air and condensate and prevent waste steam. A few systems now in operation provide different steam pressures for two or three sections of the drier, but the system hereafter discussed is the only one that gives *gradual* drier temperatures with individual drier control.

Factors Preventing Proper Drier Operation

Let us now consider the factors which prevent the proper functioning of each individual drier.

Condensation occurs in the drier because heat is lost in warming the paper and surrounding air. Unless the condensate is continuously removed from the drier, and a positive circulation of steam is maintained, the condensate may form a solid body of water within the drier particularly in a high speed news machine.

This water will travel with the drier and prevent rapid heat transfer. In a definite period of time this body of water will break and fall to the bottom of the drier and eventually be taken out through the syphon, but until so removed its insulating and cooling effect cuts down the drier efficiency. Sufficient steam should circulate within the drier to absorb the minute particles of condensate and carry them away in suspension before a solid body of water forms.

A certain amount of air enters the driers with the steam. This air, unless removed at once, will form a film on the inside of the shell or form air pockets. This data shows the effect of such air films:

Percent. of Air or Other Non-Condensable Gas	(H) Coefficient of Heat Transfer	Percent. of Maximum Heat Transfer
0.0	2900	100.00
2.0	460	15.8
5.0	29	1.0
50.0	10.5	.36
100.0	10.0	.35

H is the number of B.t.u.'s transmitted per hour per square foot of shell surface per degree Fahrenheit difference between the temperature of the steam and the temperature of the paper. For only two per cent of air there is a loss of 15.8 per cent in heat transfer.

The air film on the inside of the drier seriously affects its efficiency. The air pockets cause uneven temperatures across the face of the drier and wet streaks in the paper.

It is impossible to prevent air from entering the drier, but it can be removed at once with positive steam circulation.

And last but not least a drier cylinder may be too hot or too cold in relation to its position in the drier section.

So much for the factors which prevent the proper functioning of the drier and the production of a uniformly high quality product. As I mentioned earlier in this paper, I have had the opportunity of studying a method of drying which eliminates the un-

*Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., February 18, 1930.

[1]President, Rasmussen & Co., Engineers, Chicago, Ill.

satisfactory conditions mentioned above and insures continuous uniform operation of a drier section. This method also graduates the drier temperatures so as to provide what we shall now consider as gradual drying.

This paper will later discuss the reasons for the efficient results accomplished by graduated temperatures. Plate II shows three curves of drying temperatures for a machine making 45 to 50 tons of 60-pound test kraft per day. The horizontal scale shows drier numbers with dried No. 1 at the wet end. The vertical scale shows drier surface temperature in deg. F.

Experiment has proved that to get the most perfect drying for the majority of grades with a smooth, uniformly dried sheet, the temperatures of the various driers should follow approximately the middle curve beginning at 160 deg. F. at drier No. 1 and rising gradually with a slightly convex curve to the evaporating temperature of 240 deg. F. at drier No. 12 and thence in a straight line to the end of the drier section.

The top curve shows the usual drier surface temperatures with steam connections in general use today. Driers No. 1 and No. 2 are too hot, No. 3 is so hot that it sears the paper, 9, 23, 25, and 27 are above the ideal curve and 22 and 26 are so comparatively

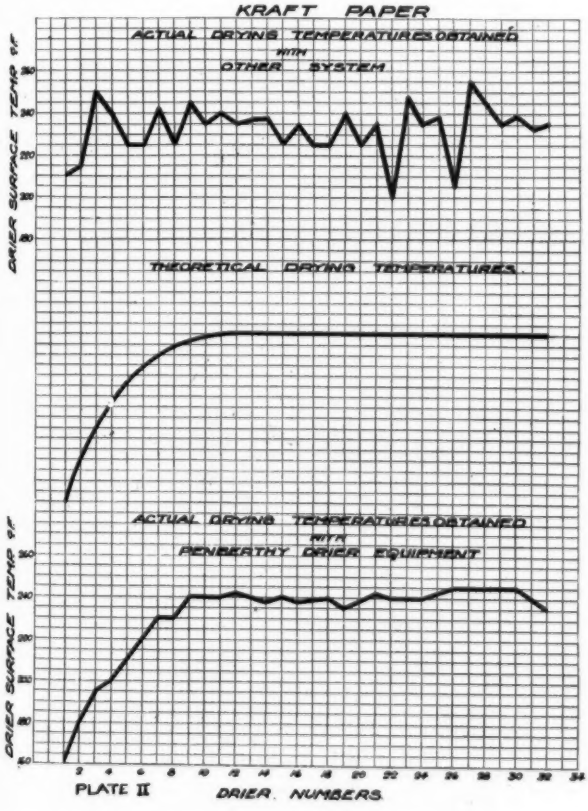

KRAFT PAPER
ACTUAL DRYING TEMPERATURES OBTAINED WITH OTHER SYSTEM
THEORETICAL DRYING TEMPERATURES.
ACTUAL DRYING TEMPERATURES OBTAINED WITH PENBERTHY DRIER EQUIPMENT
DRIER SURFACE TEMP. °F.
DRIER NUMBERS

PLATE II

cool as to be doing very little work and actually cool the sheet and increase the work of the following driers. Obviously the paper will not be dried uniformly and maximum efficiency will not be obtained.

The bottom curve also is an actual curve from the same machine after graduated temperatures were obtained closely approximating the ideal. In this case it is equally obvious that the ideal drying conditions are almost reached with consequent improvement in uniformity and efficiency.

Plates V, VI, VII and VIII show typical curves for other grades of paper.

Equipment Necessary to Accomplish These Results

As was pointed out before, some means must be provided to automatically control the quantity of steam to each of the individual drier cylinders and by inducing steam circulation to remove the condensate and air, thereby keeping each drier in efficient operation. This has been accomplished by the use of jets on each drier operating on the venturi principle.

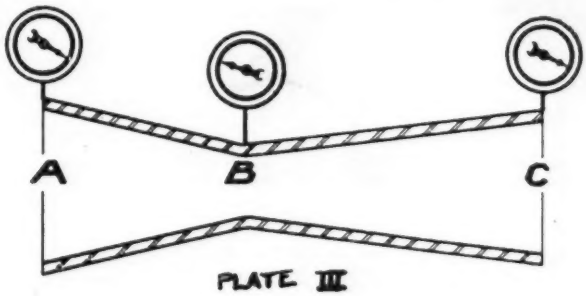


PLATE III

When steam flows through a tube with longitudinal section similar to the illustration in Plate III, a drop in pressure or sucking action is established at the smaller diameter "B." This drop in pressure decreases as the diameter increases until at the outlet "C" the pressure is again practically the same as at "A." Therefore, a tube constructed as shown in Plate III will deliver approximately the same amount of steam as an equal length of straight pipe having the same inside diameter as represented at point "A." If, however, the reduction in area is greater than 60 per cent of the original cross section, it cuts down the steam flow, and the pressure at the outlet. This temporary loss in pressure at "B," known as the venturi head, varies with the rate of flow through the tube.

This principle is not new. The Bernoulli Theorem states that the total head of a flowing liquid or gas at any point in its stream line is equal to the total head at any other point providing undue friction and work have not intervened.

Let us trace the steam through a drier, and discover how the principle described in the preceding paragraphs can be used to insure the efficient operation of a drier.

Plate IV shows a cross section of the steam connections to a drier, each drier the same, with special fittings designed to produce the effect desired.

The circulator is a fitting with a longitudinal section similar to the illustration in Plate III. One end of the cross-over pipe "X" joins the circulator at a point corresponding to "B" in Plate III where a gap is provided in the tube and the other end connects with a fitting on the drier drain pipe.

Steam flows from the steam supply header into the drier through the circulator. The drop in pressure at "P" is transmitted to the drain header through the fitting connected to the drier drain pipe and the pressure within the drier forces the condensate up the syphon pipe into the drain header.

The separator on the drain pipe removes the water from the steam. The water passes through the tail piece "W" into the condensate header and the steam flows through the cross-over pipe "X" back into the drier. The inner nozzle "T" is of sufficient size to pass the condensate and in addition enough steam to establish circulation in the drier with complete air and water removal.

The automatic air vent "U" removes the air and permits an early start on Monday morning. During the week continuous air removal is insured by a special centrifugal pump handling the condensate.

When the drier is emptied of condensate, the water seal at the end of the syphon pipe inside the drier is broken and naturally steam will then follow the course heretofore taken by the condensate, and be recirculated, without loss or waste.

The successful application of these principles results in complete air and water removal, constant circulation of the steam in the driers, and uniform drying at maximum drier efficiency.

We have established a simple, economical and automatic means of circulating the steam through the drier and removing the condensate and air. Now we must control the amount of steam entering each drier to obtain a gradual drying rate which will prevent undue shrinkage of the sheet, minimize snap-offs and eliminate cockles and other evidences of incorrect drying.

This is merely a matter of fitting the proper size of throat in the circulator. The ideal curve is closely approximated in practice.

What Does Gradual Drying Accomplish?

Actual operation on a great many paper machines making various grades of paper, in many sections of the country, has proved that gradual drying and the proper functioning of each individual drier has accomplished the following results:

1. It improves the quality of the paper because the entire drying process is at a lower temperature.

Improved quality is realized by: a. Elimination of searing or case hardening. b. Elimination of cockles. c. Reduced shrinkage d. Fewer snap-offs. e. Proper moisture content. f. Elimination of wet streaks. g. No crystallization of size and other chemicals. h. Increased strength. i. Better finish. j. No curling edges in sheets. k. Elimination of felt seam marks.

2. It reduces steam consumption.
3. It permits lower operating steam pressures within the drier.
4. It increases production because the machine can be operated at a higher speed and produces more salable paper.

Lower Temperatures

The paper fiber begins to deteriorate at temperatures over 170 deg. F. In the usual drier with high steam pressures the vaporization temperature of the sheet may reach 220 deg. F. With gradual drying, however, lower steam pressures are used and the temperature of vaporization is as low as 150 to 160 deg. F. This means, of course, no deterioration of the fiber and consequently greater strength.

The important part that lower temperatures play in maintaining high quality has been most thoroughly demonstrated by the success of the Minton vacuum drier.

Prevention of Seared Condition

A seared or case hardened sheet is caused by too rapid drying in the first driers destroying the moisture protecting the fiber and allowing the dry fiber to come in contact with a hot drier. The surface of the sheet is baked and the center of the sheet cannot be dried. This case hardened sheet is brittle and discolored.

If the rate of drying is slowed down at the wet end, as is possible with gradual drying, the moisture is removed only as fast as it comes to the surface by capillary action and the sheet is properly dried.

Elimination of Cockles

Cockles are caused by a formation of steam pockets between the drier surface and the sheet of paper. Such a condition will cause rapid shrinkage of the sheet itself or of the drier canvas. If the canvas shrinks it will pucker up the sheet and cause a wrinkle.

With gradual drying the moisture is removed from the surface of the sheet at the proper rate, the sheet assumes a uniform flatness because of uniform temperature and moisture content, and the lack of undue moisture in the center of the sheet prevents it from lying irregularly.

Reduced Shrinkage

During the process of hydration in the beater and jordans,

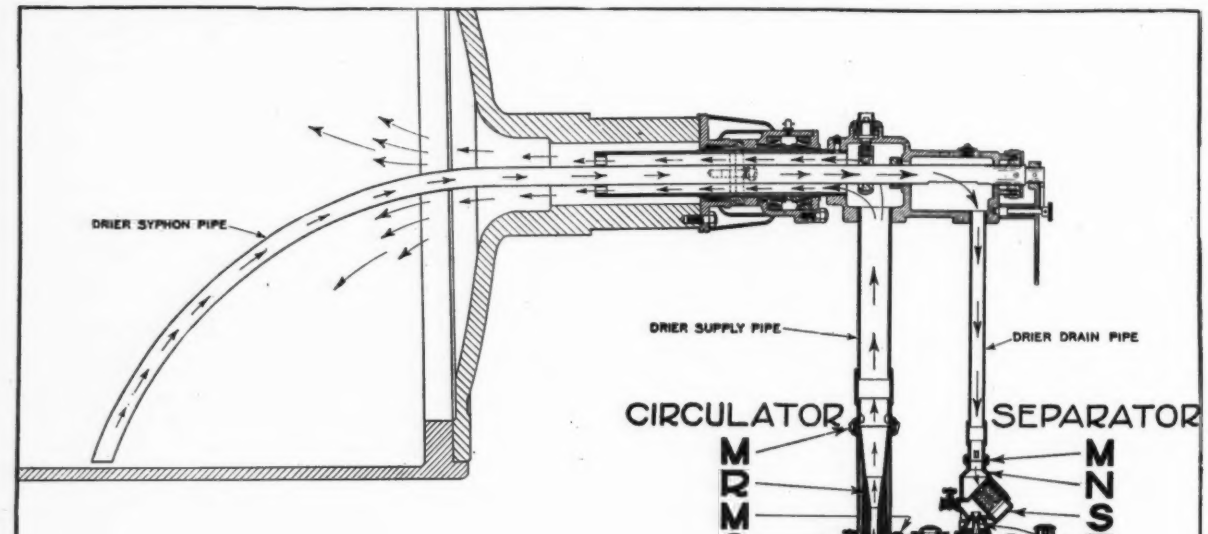


PLATE IV

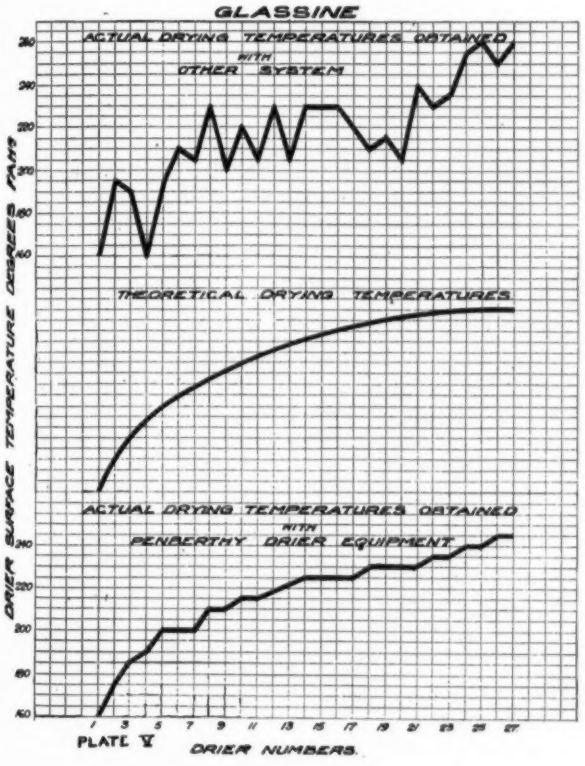
water is thoroughly beaten into the fiber. This water is not merely mixed with the fibers but becomes a part of the fiber itself with a consequent increase in diameter. Proper drying requires that the moisture surrounding the fiber be evaporated but that which is a part of the fiber itself should remain. If the drying is not properly done from the wet end of the drier section to the dry end, if the temperatures become so high at the wet end that they generate steam, the fibers will up end, their bond will be destroyed and the web will shrink both across the grain and with it.

With gradual drying, the temperature of each drier is so regulated that the moisture is evaporated from the sheet only as rapidly as capillary attraction will bring it to the surface. Then when the sheet reaches the end of the drier section, the fibers are still protected with enough moisture to prevent the removal of the water in the fiber itself.

The shrinkage across the grain of a kraft sheet has been found to be as high as 5 per cent to 7 per cent whereas with gradual drying this shrinkage is as low as 3 per cent. To the mill this means a wider trim with correspondingly increased production, and in many cases the use of a machine for orders that otherwise could not be made.

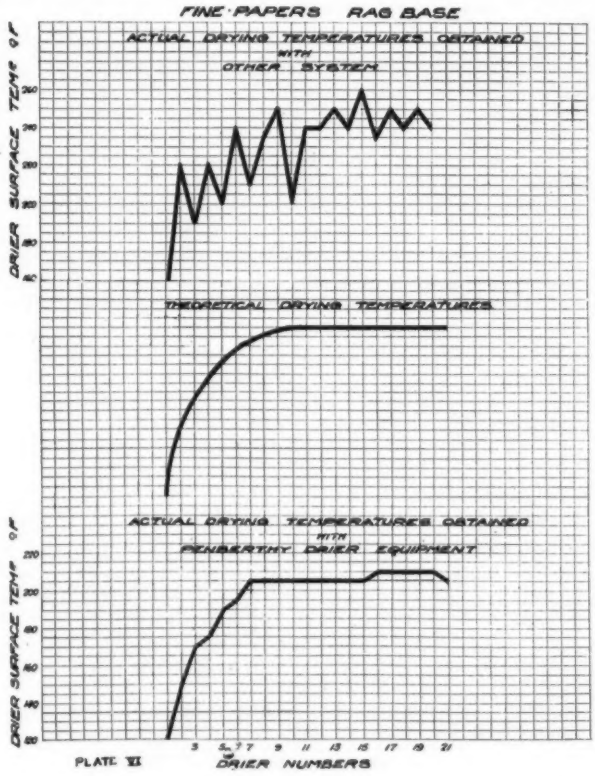
Fewer Snap-Offs

On the usual paper machine the lower drier canvas is in the


GLASSINE
ACTUAL DRYING TEMPERATURES OBTAINED WITH OTHER SYSTEM
THEORETICAL DRYING TEMPERATURES
ACTUAL DRYING TEMPERATURES OBTAINED WITH PENBERTHY DRIER EQUIPMENT
DRIER SURFACE TEMPERATURE DEGREES FAHR
DRIER NUMBERS
PLATE V

basement or in a comparatively cool pit, therefore, the upper canvas is subjected to a considerably higher temperature under the hood. As the paper emerges from between a top drier and the canvas, it is at a higher temperature than when it emerges from a lower drier with the result that the paper is alternately hot and cold. The effect known as "saw tooth" drying is produced and the paper shrinks and expands half as many times as the total number of driers. This "saw tooth" drying effect shows up most seriously at the dry end with the result that the paper snaps off at the calender of 5 or 6 driers back.

When the the temperature of each individual drier is under control, the amount of steam admitted to a top drier should be less than to the corresponding bottom drier. This will compensate for the difference in temperature between the top and bottom drier canvases. The sheet will come off the bottom drier at the same temperature as off the top. This results in a uniform stretch or hug of the sheet from one end of the drier


FINE PAPERS RAG BASE
ACTUAL DRYING TEMPERATURES OBTAINED WITH OTHER SYSTEM
THEORETICAL DRYING TEMPERATURES
ACTUAL DRYING TEMPERATURES OBTAINED WITH PENBERTHY DRIER EQUIPMENT
DRIER SURFACE TEMP °F
DRIER NUMBERS
PLATE VI

section to the other. As a result of this uniform hug, snap-offs are reduced to a minimum, and drier canvas life is prolonged.

Proper Moisture Content

Paper should leave the driers with a moisture content as high as possible,—9 per cent on newsprint. It is desirable to have that amount of moisture in the sheet for two reasons:

1. It permits the shipped weight to contain a greater number of pounds of paper per pound of air-dry raw material.

2. More important, however, is the fact that a certain amount of moisture is required in a good quality paper.

The importance of this moisture content in the finished paper depends upon the purpose for which it is to be used. Newsprint, for instance, should contain sufficient moisture to prevent the formation of static on the presses. If static collects in unusual quantities, the sheet becomes "alive," will not run true, is attracted by iron and steel, and snaps off easily. If the paper is too dry, it liberates a fine flour-like dust or fuzz which soaks up ink. This is particularly important in the case of sulphite sheets. Unless the moisture content is uniformly distributed throughout the sheet, it is difficult to produce a uniformly fine printing job.

With gradual drying, it has been found possible to complete the drying process with 9 per cent of moisture still remaining in the paper and with no discoloration.

It sometimes is desirable to lower the temperature of the last few driers so that the sheet is cooled before it enters the calenders. This applies particularly to sulphite sheets and kraft.

A cool reel of paper means a better roll. If the sheet is too hot when wound on the roll, considerable heat will remain in

the roll resulting in a gradual drying and deterioration of the fiber and warping of the sheet.

In one particular mill the sheet left the driers too hot and caused deep wrinkles to appear in the reel. These wrinkles were carried on to the wrapped and shipped roll, and when run on fast presses the wrinkles caused trouble. After gradual drying was adopted the temperature of the sheet was decreased and the wrinkles disappeared.

The mill that ships a perfectly wound roll and a strong uniform sheet with proper and uniform moisture content, will have a satisfied and steady customer.

Elimination of Wet Streaks

Wet streaks may be caused by improperly crowned press rolls. In such cases the sheet leaves the last press with an uneven distribution of moisture throughout its width. Wet streaks are sometimes the result of a pocket of air in a group of driers. Such a pocket prevents the application of heat to the paper. A portion of the sheet is more wet than on either side of this wet streak. If the moisture distribution is very uneven, a wet streak may pass through the entire drier section and at the calenders become a hard, burnished, blackened spot.

With gradual drying and a free circulation of steam within the drier the wet streak will cool that section of the drier, the circulation of fresh steam will immediately reach the cooler section, and a greater amount of work will be done where it is

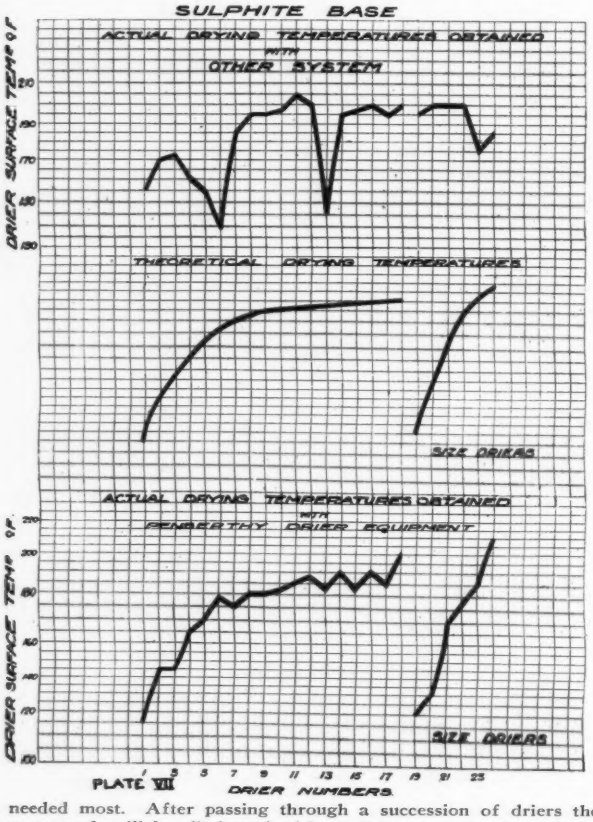


PLATE VII

needed most. After passing through a succession of driers the wet streak will be eliminated without damage to the sheet.

Furthermore, by slowing up the rate of drying at the wet end with moisture removed only as fast as it is brought to the surface by capillary action, the excess moisture in the sheet will be drawn to both sides and removed in that way. The result is a higher rate of evaporation in the evaporating section because the moisture passes freely through the sheet.

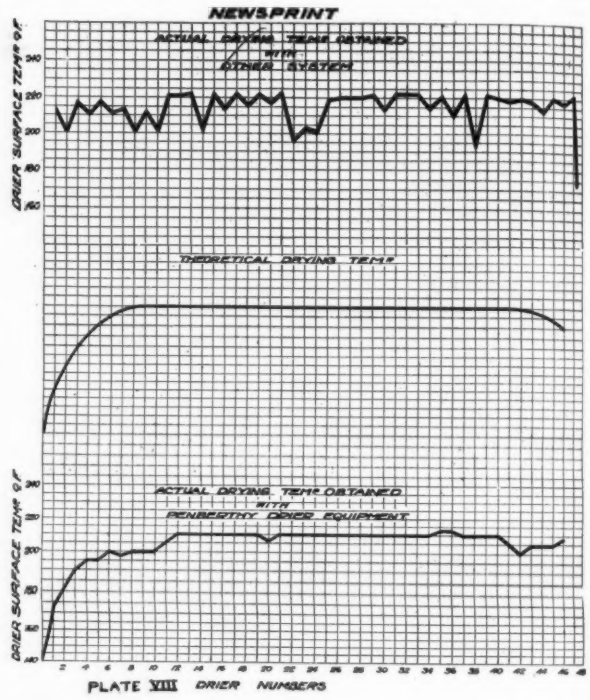
No Crystallization of Chemicals

If the sheet is dried too rapidly, or at too high a temperature at the wet end of the drier section, alum or rosin will crystallize into hard, minute particles. If these chemicals crystallize from the sheet, their bonding capacity is lost.

But with gradual drying, with comparatively low temperatures at the wet end, the size and alum is set and hardened, the chemicals function properly and disintegration and crystallization is prevented.

Increased Strength

If the web is dried too quickly at the wet end, if the temperature


NEWSPRINT
ACTUAL DRYING TEMP. OBTAINED WITH OTHER SYSTEM
DRIER SURFACE TEMP° F.
THEORETICAL DRYING TEMP.
ACTUAL DRYING TEMP. OBTAINED WITH PEMBERTHY DRIER EQUIPMENT
DRIER SURFACE TEMP° F.
PLATE VIII DRIER NUMBERS

is too high, the surface of the sheet will become case hardened with loss of strength.

With gradual drying the proper temperature gradient is maintained from wet end to dry end, the moisture is removed by degrees, the surface fibers are at all times protected by a film of moisture, the bonding effect of the size and the interlocking of the fibers are not lost and maximum strength is assured.

Better Finish

A high finish is possible with gradual drying because the moisture content of the sheet is increased 2% to 3% and it is uniformly distributed.

No Curling Edges in Sheets

If the shrinkage in the web of paper is uneven internal stresses are introduced. Then when the roll is cut into sheets these internal stresses curl the edges of the sheet or cause it to buckle or pucker.

Gradual drying eliminates the "saw-tooth" effect, no internal stresses exist, and the paper lies flat when cut into sheets.

Elimination of Felt Seam Marks

Drier felt marks are caused by the pressure of the drier canvas seam on the sheet at the wet end. If the drying is too rapid at the wet end, the sheet will become hard on the surface and these felt marks will remain. If, however, the drying is slowed up at that end, and the sheet is dried slowly from its center toward its surface, these marks will smooth out or disappear by the time the sheet is thoroughly dry. In other words, gradual drying keeps the surface moist and flexible, slowly increasing the amount of moisture removed until shrinkage ceases at which point there is still sufficient moisture in the sheet to permit the ironing out of felt marks.

Reduced Steam Consumption

With the systems of drying in general use the work done by the several sections of the drier is approximately as follows:

First quarter	39 per cent
Second quarter	29 per cent
Third quarter	22 per cent
Last quarter	10 per cent
Total	100 per cent

The first three-quarters do 90 per cent of the work leaving only 10 per cent for the last quarter. If the work can be more evenly distributed efficiency must necessarily be raised.

By a proper graduation of drier temperatures the work done in the first quarter can be slowed up and shifted to the last section divided as follows:

First eighth	6 per cent
Next eighth	17 per cent
Second quarter	27 per cent
Third quarter	27 per cent
Last quarter	23 per cent
Total	100 per cent

Each quarter of the drier section does approximately a quarter of the total work. This is one reason for increased efficiency.

Let us refer once more to Plate II and compare the uneven temperature curve at the top with the fairly even one at the bottom. It is obvious that under the first condition driers 22 and 26 are doing little work and are cooling the paper to make more work for driers 23 and 27. This not only affects the quality of the sheet adversely but for a given production makes necessary a higher temperature and pressure in the remaining driers. If driers 22 and 26 were functioning properly, the temperature and pressure in the steam supply header and all other driers would be lower which would improve the sheet, or else the same pressure could be used and production increased accordingly.

Lower Operating Steam Pressures

The circulators give positive steam circulation to the driers and permit the use of lower pressures, often below atmospheric pressure, with consequent lower condensate temperature and greater recovery of heat from the steam. In other words the drier section will do the same amount of work at a lower pressure with lower back pressure on turbine or reciprocating engine.

Stated in another way gradual drying reduces steam consumption because each section of the drier does a fair proportion of the total work, each individual drier functions properly, and lower steam pressures are used.

In actual practice drier efficiency has been increased from between 60 and 70 per cent to an average of 82 per cent, and steam consumption has been cut in half.

Increased Production

The production of any paper machine is limited by its drying capacity. In other words if the paper enters the drier with a given moisture content, the speed of the machine is limited by the amount of moisture that can be removed without damage to the product.

In actual practice with gradual drying speed has been increased as much as 10 to 20 per cent. Shipped paper was increased 20 per cent in one mill without an increase in machine speed. This was possible because of wider trim where a few inches more paper meant an extra roll, less lost time, and fewer snap-offs.

Less broke went back to the beaters and more salable paper was produced.

In a number of cases mills have installed gradual drying and have found it unnecessary to purchase more driers to increase production.

Evaluated Savings

Not all of the advantages of gradual drying are subject to evaluation, but increased production of salable paper and decreased steam consumption are readily translated into increased profits.

Let us again consider the 50-ton machine, making 40 pound sulphite bond, with a manufacturing cost of $20.00 per ton and steam at $.40 per 1000 pounds.

If gradual drying results in an increased production of 5 tons per day of salable paper, and a reduction of one pound of steam per pound of paper dried, it effects a saving of $100.00 per day for increased production, and $40.00 per day for lower steam consumption, a total of $140.00 per day or $42,000.00 annually.

Economies in the beater room as the result of less broke to handle, saving in power to drive the driers with no load of condensate to drag, and longer felt life because of uniform drying are likewise important.

Improved Quality Most Important

Possibly the most important advantage of all is the fact that the uniform drying with increased strength, better finish, and absence of cockles and felt marks means satisfied customers. In fact if a mill has an excess of low pressure steam so that steam economy is not important, a better product and reduction of complaints from customers is sufficient to make gradual drying alone a necessity.

It has been my purpose in this paper first to explain what is meant by gradual temperatures in paper drying, then how it can be realized, and last what it means to the mill operator in the way of increased profits and the elimination of drier faults.

Water Resistance Sub-Committee Report

By P. W. Codwise, Chairman

The work of the sub-committee on water resistance is progressing favorably and we expect by the time of the next annual meeting to recommend definitely a method for adoption as standard for determining the total size resistance of paper products.

A consideration of the field to be covered in establishing such a method indicated the desirability of dividing the work into two sections, namely, tests upon paper 0.009 inch or less in thickness, and tests upon products over 0.009 inch in thickness. Work is well under way upon the lowered calipered papers and we wish to express our appreciation of the cooperation of various members in submitting lots of paper for test. It is planned to shortly complete the cooperative work upon these and to get the work upon the heavier papers under way.

A survey of previous work indicated that the choice of a standard method for the thinner papers, at least, lay between the curl method and the dry indicator method. Both of these procedures have been carefully reviewed and rewritten in detail. Previous work had indicated the necessity of doing this as there are many possibilities of personal error entering into the determinations unless each step is carefully restricted in procedure and unless the precautions are carefully observed in making the determinations. It has further been ascertained that results by both the curl method and by the dry indicator method must be carried out independently from the wire side and from the felt side of the sheet as upon certain papers the test results are different from the two sides of the sheet.

The total water resistance of a sheet of paper is composed of several factors and with the object of bringing this matter into greater prominence, the writer is presenting an article upon "Determination of the Degree of Surface Sizing of Paper and Paper Board" as having a bearing upon the activities of this committee.

TAPPI Section, Page 80

Modern Stoker Fired Steam Generating Units*

Standards of Engineering Design That Should Be Applied For Maximum Reliability and "Use Factor"

By Joseph G. Worker[1]

A few years ago when our present methods of burning coal in power plants for steam generation was first introduced, there were certain striking and outstanding features characteristic of all the most notable installations. Some were striving for very high efficiency, others for high capacities, and others followed the fashions, with the result that we now have many different kinds of so-called modern boiler settings.

Some boiler settings are wide; some are high; very few have heating surfaces arranged alike; some are fired with stokers; some with powdered coal; others with oil. Some of these boilers are built for higher pressures than has been the vogue; others are equipped with economizers, some without economizers, and still others are solved with an air preheater and some with both preheaters and economizers, etc.

The thermal issue, as far as these plants are concerned, seems to have been pretty well defined and settled. At least, we have data and facts as to what the thermal possibilities are through actual experience.

We are, however, still in the midst of an economic or business consideration of the utility of these boiler units.

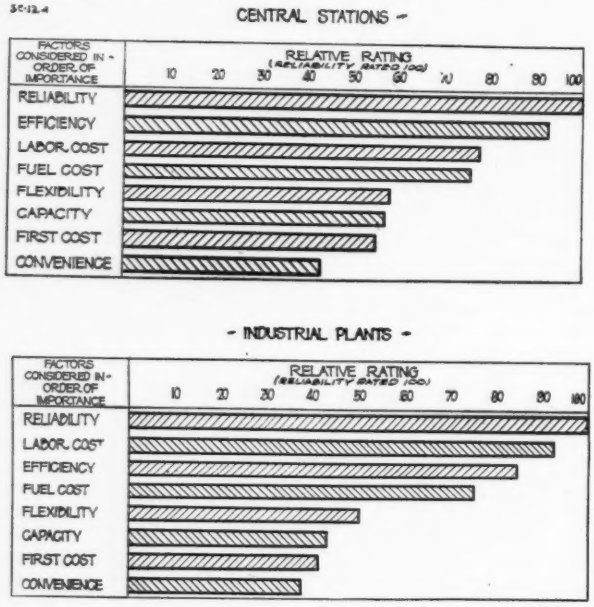


FIG. 1

Factors by which combustion equipment is selected.

Out of all of this somewhat complicated picture, there seems to have come a factor of great importance which must be settled before we can build the best setting with all of the good points that we have to-day and the poor ones eliminated. This factor is reliability or dependability of the apparatus after it is put into operation, and its "use factor."

It is significant that this is the first requirement of central stations in their selection of fuel burning equipment. Other factors for central stations in order of their importance are:—low maintenance; operating labor; low fuel cost; ability to meet sudden load changes; high capacity; operating convenience and low first cost.

Reliability is also the first requirement of industries in the selection of equipment for their power plants. Low maintenance and operating labor, however, seem to come second. Fig. 1 shows the relative influence of these different factors in the selection of fuel burning equipment for both central stations and industrial plants.

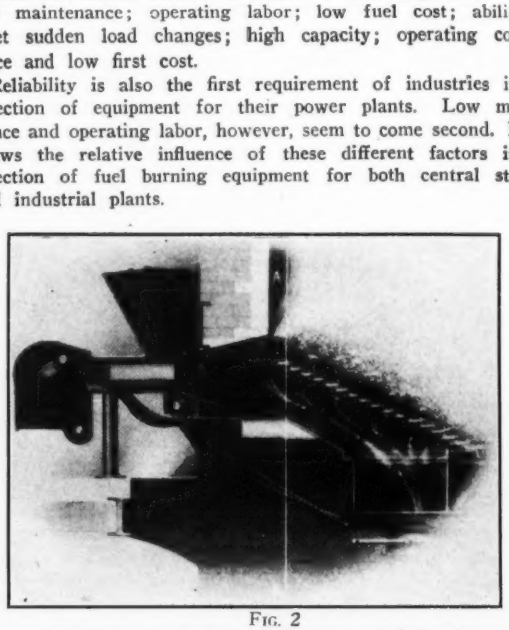


FIG. 2

Fuel feeding mechanism for old design underfeed stokers.

With a knowledge of the importance of the "use factor" and with some facts at hand, it is quite natural for stoker engineers to use this factor as the basis of engineering design for their devises and there is no better method to determine the ability of apparatus than to measure it under practical operating conditions.

I would like to discuss in this paper the influence that the stoker has in the reliability of steam making, and what stoker designers are doing in their efforts to increase the "use factor" of mechanical stokers.

We are in a state of boiler room operation where equipment must continue in service for very long periods. It is becoming too costly to take large boiler units out of service because of any part of the unit failing. The fact that a stoker and boiler unit is entirely enclosed is exerting a very favorable influence on the reliability of the unit, just as turbine units are enclosed in a steel casing for safety, reliability and dependability.

Conveying Coal to Stoker Hoppers

It is not generally realized how comparatively simple and reliable is the method of transporting coal to stoker hoppers. Stokers take coal as it comes from the mines, crushed to a suitable size. If the conveying part of the process fails, it is possible to get coal to the stoker hoppers in another way. I have in mind, for example, a plant where the coal conveying equipment failed but this did not stop the stoker operation, because it was possible to shovel coal into the stoker hoppers. In another plant, where the fans failed, the stokers were operated on natural draft and carried a portion of the load until repairs were made.

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 19, 1930.

[1] Assistant to the president, American Engineering Co., Philadelphia, Pa.

If the unit itself is made dependable for long runs, outside plant equipment cannot affect its reliability to a great extent. For maximum reliability of steam generation the entire process being tied up in one unit, will be most favorable for maximum usage.

Starting Up Stoker Equipment

A few years ago boiler and stoker units were of very small size as compared with the modern units of today. They were so much alike in design that it was not very difficult to standardize the method of putting them into service. For example, a 500 h.p. boiler seemed to be the popular size, and there were so many of these installed that it was only in exceptional cases where anything unusual happened in starting them. The pressures were about the same, the superheat requirements did not vary to any great extent, and there were not very many things about the stoker that had to be watched when starting up a plant.

In many cases of present power plant methods this same procedure, perhaps unconsciously, has been followed with our more modern stoker and boiler units. Because a boiler unit today has so many new things attached to it, it has been found that in the starting up of plants one thing or another might happen, making it necessary to take it out of service until changes are made. It seems that we have not extended the same engineering skill in the starting up of plants as has been manifested in the creation of its design. This situation might be explained by an example of how carefully engineers abroad go into a plan for starting up new units. In one particular case, the procedure was as follows:—

In a modern boiler setting mechanical defects may show up in starting, such as defective high pressure fittings, boiler tubes, superheater tubes, water walls, etc., so that by a process of elimination all elements are not tried out at one time. It is first proposed that in starting no combustion problems will be involved. A very good grade of coal will be selected of which its action in firing is well-known, and even though it is a better grade of coal than will ultimately be used at the plant, a knowledge of this good coal will assure, on the start, no problems in its burning. If a plant is designed for high preheat, the start will be on cold air planned for a definite period of operation; then a small amount of preheated air will be run for a certain established period. At the start the unit will not be put to test for its ultimate capacity but rather a normal rating will be rigorously adhered to until it is definitely established that all mechanical parts have stood the test of normal rating. Then the unit will be gradually tested for high capacity, after the unit has stood the test for all mechanical defects, the burning of the various grades of coal that normally will be used at the plant will be started with the assurance that no mechanical interruptions will interfere with the problems of burning coal to the best advantage both as to efficiency and rate of burning.

Control of Stoker Fuel Beds

The control of the fuel bed and especially the big fuel beds

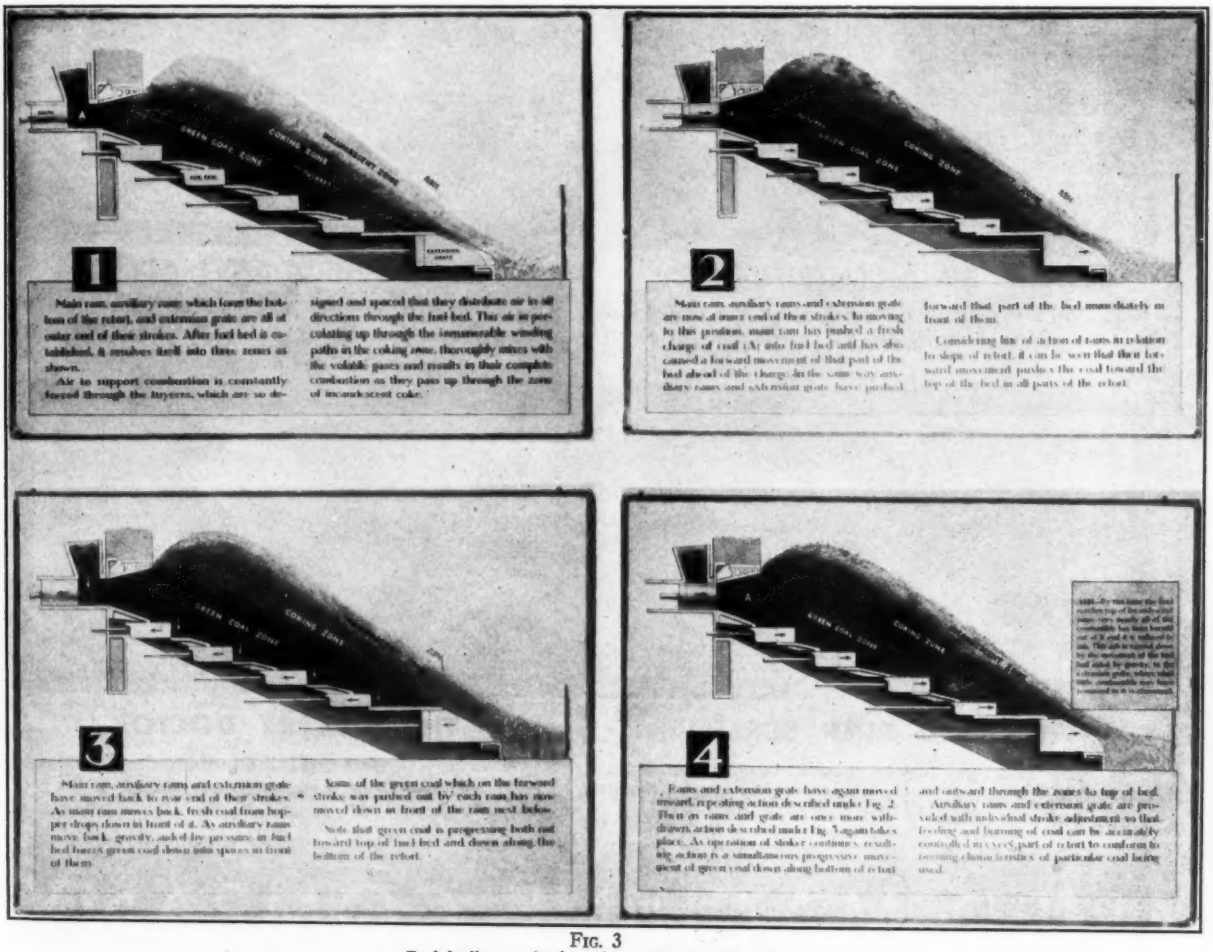


FIG. 3
Fuel feeding mechanism of new high capacity stokers.

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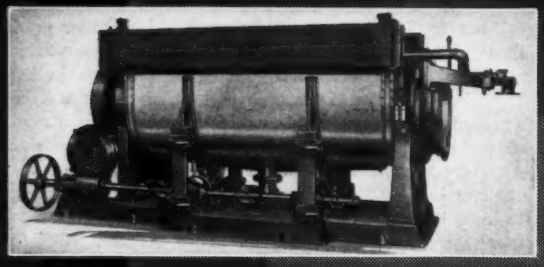

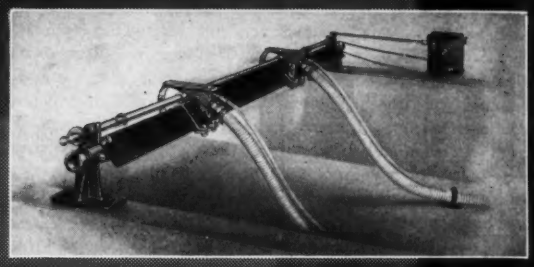

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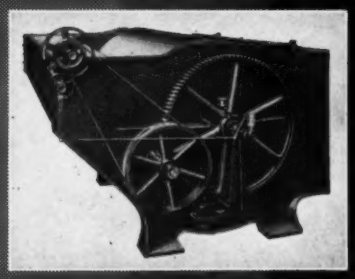

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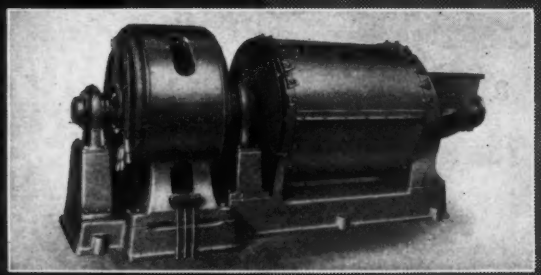

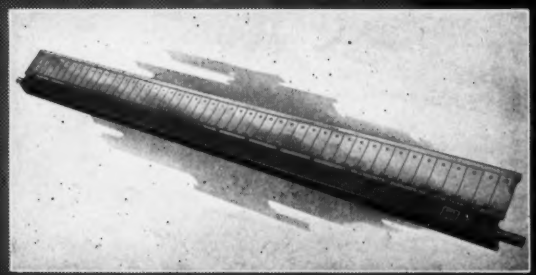

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required for large steam units introduces forces that must be opposed by the mechanical design of the fuel feeding structure of a stoker mechanism. When stokers were only eight or ten feet long, as of a few years ago, the fuel feeding design as shown in Fig. 2 was ample to withstand any forces introduced in handling the fuel to the grates. With larger stokers a completely new development, although following the same principle, but really a new departure in design, has taken place as shown in Fig. 3. An example of how the design of different parts has changed due to this influence of controlling all parts of a big fuel bed is shown by the design of the fuel feeding mechanism as shown in Fig. 4. This shows how much more strength is being put into the high capacity stoker than the smaller stoker of a few years ago.

Along with the more powerful stoker structure must go ease and simplicity of adjustments to aid in the dependability of operation. This has been accomplished by a series of pushers or rams, Fig. 5, so that wherever the fuel bed requires adjustment, each pusher can be changed individually from the front of the stoker when in operation.

The modern stoker design has brought out new thoughts as to elevation and floor lines. There was a well-known floor line that became standardized a few years ago for all stoker installations. New stoker settings are ignoring these past precedents so that two or more elevations for a stoker structure are provided and there is not the need or necessity to adhere to old accepted theories regarding floor lines, aisle space or room required around a stoker.

An example of this new method is shown in Fig. 6, where the speed boxes are controlled and inspected from a gallery which might be termed a new stoker floor line. The individual control of the mechanism for regulating the fuel bed pushers is now taken care of on a separate floor line, accessible from the front of the stoker.

Example of Modern Stoker Operation

I would like to cite an example of an accomplishment of "use factor" of stokers in actual practice. This was a modern 45 tuyere underfeed stoker applied to a 1000 h.p. boiler. It was the one dependable boiler unit in a heating plant that furnished heat to

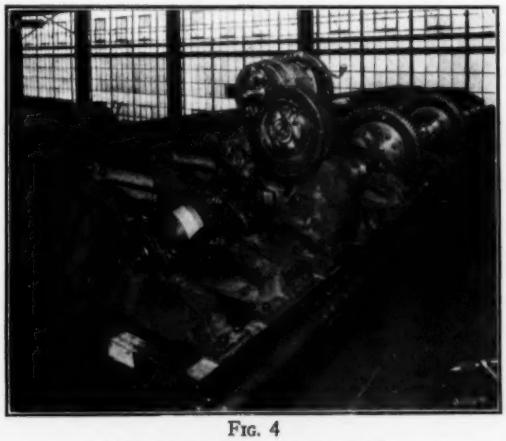


FIG. 4
Increased strength of stoker structure.

important office buildings, hotels and business houses. It was absolutely necessary that the unit stay on the line—and it did for about four months—the maximum and minimum steam output during this period is shown in Fig. 7. The furnace is equipped with partial water cooling on the two side walls and rear wall, as shown in Fig. 8.

After the unit was taken off the line a careful inspection was made and the indications were that the unit could have run much longer as there were no apparent immediate repairs required for the stoker, water wall or boiler.

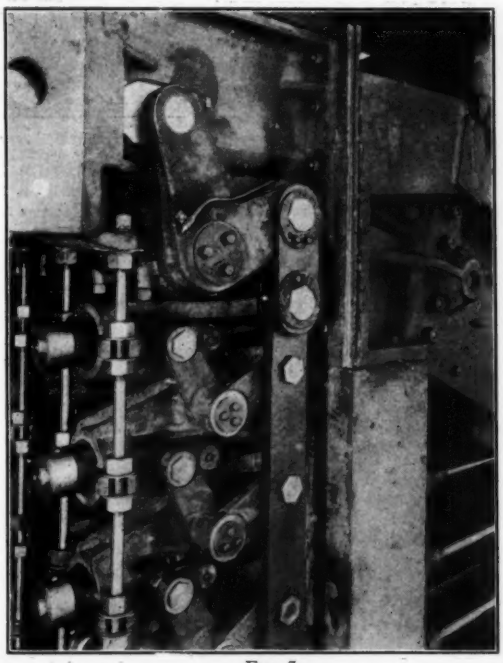


FIG. 5
Powerful stoker structure for adjustment of big fuel beds.

This kind of reliability of a stoker and boiler unit is even more important to an industry that depends more on the operation of a boiler unit for their plants' production. A case might be cited of a paper manufacturing plant where it was necessary to keep one boiler in operation for fifteen months, only taking it off on Sundays. This boiler and stoker operated six days in the week, twenty-four hours a day, at a steaming capacity of 75,000 pounds of steam or 300 per cent boiler rating. During this period

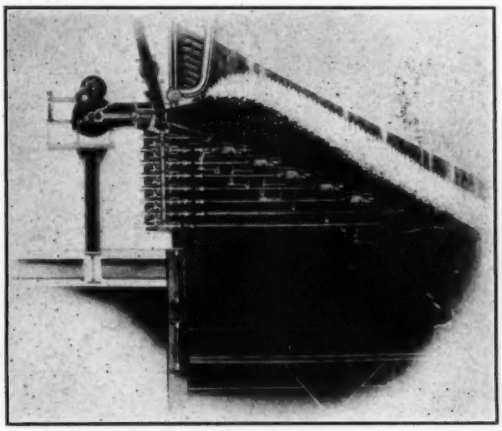


FIG. 6
Stoker structure with gallery for inspection and control of stoker speed boxes.

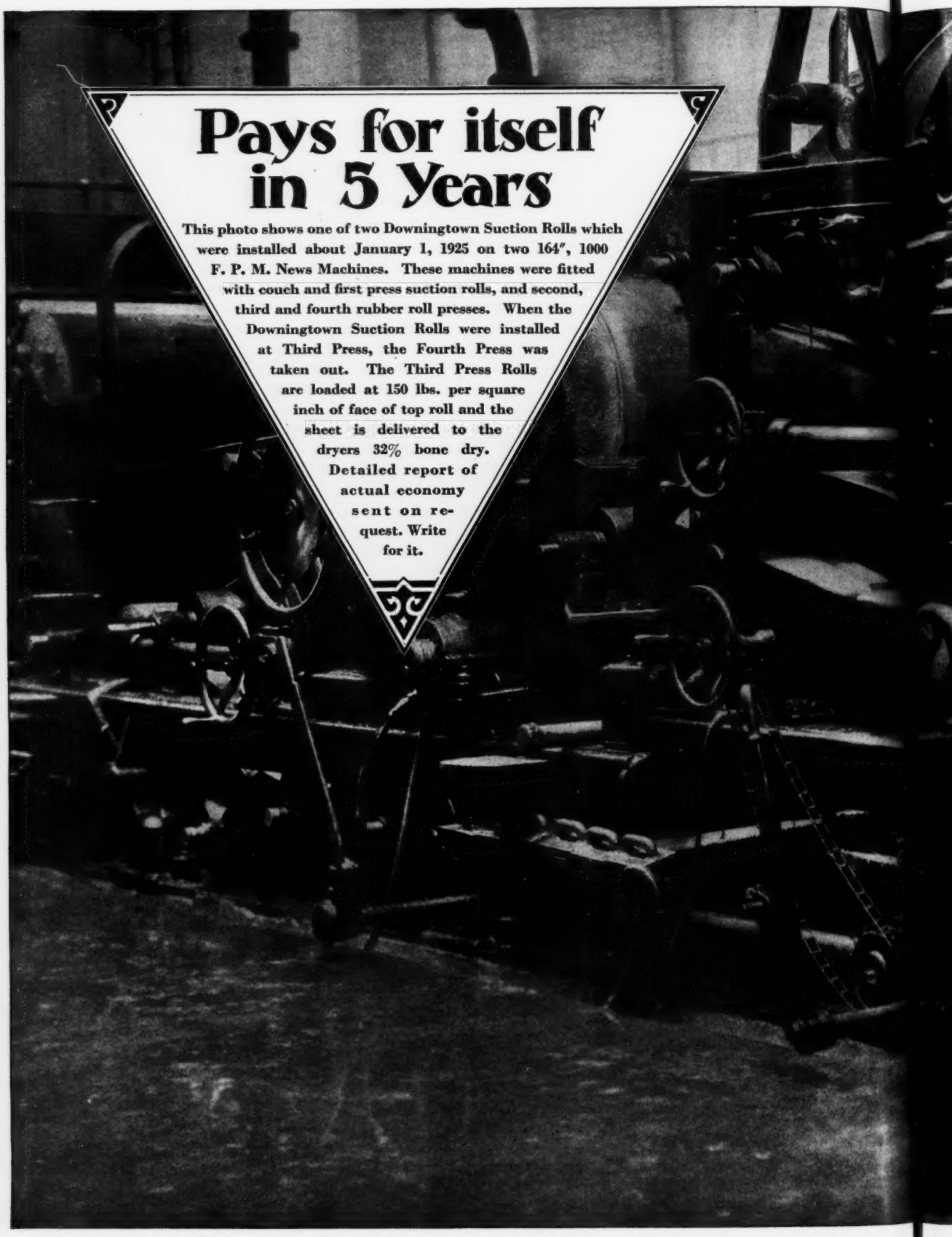
this company had no other boiler as they were re-vamping their boiler plant, so that when this boiler went down, the output of paper had to stop.

This particular boiler was equipped with a modern 41 tuyere underfeed stoker and the furnace was completely water cooled.

With these examples it is possible to keep modern stoker units in operation over a definite established period.

Old Stoker Installations Revamping for Increased Steam and Efficiency

I have had occasion to point out in another place the influence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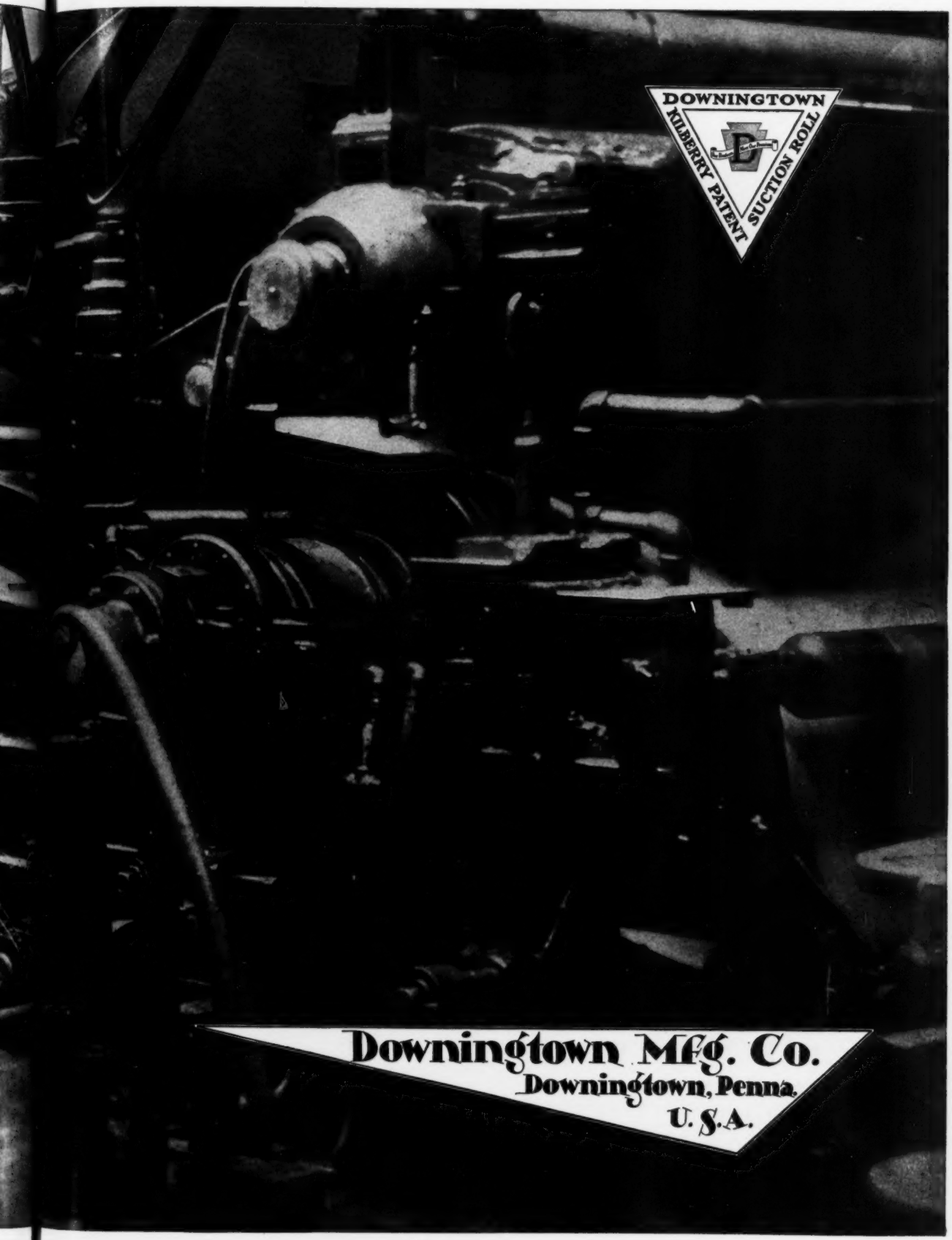
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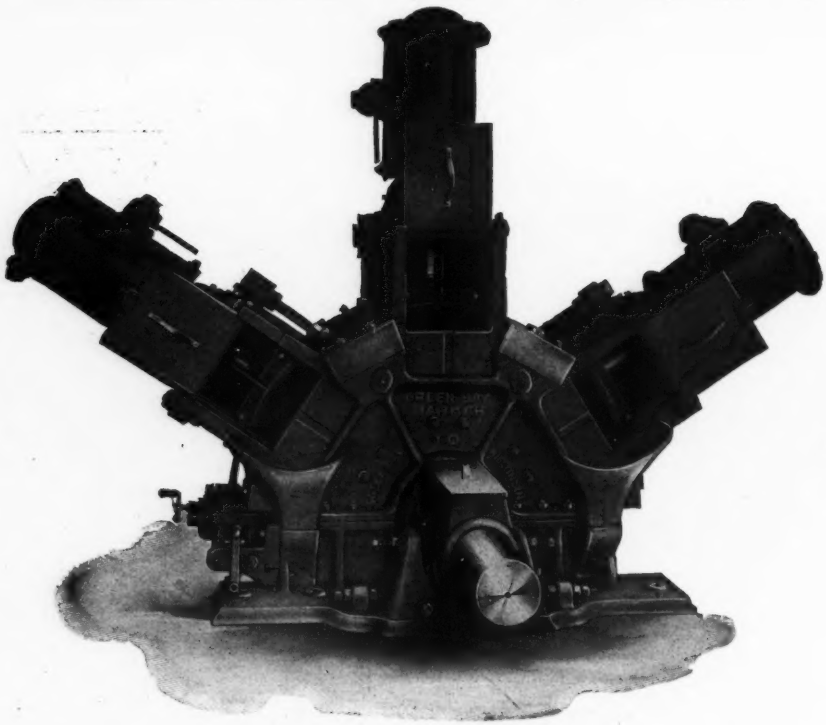

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of the modern stoker and boiler unit in bringing large revenue to the newer plants by long run periods of reliability.

Older plants are shaping their expansion to take advantage of these results by removing old stokers and putting in modern water wall furnaces and more modern stokers and, in some cases, introducing preheated air for combustion. Not only higher operating efficiency is obtained, but greater increased steam outputs and greater "use factor."

Let us review some of the plans that important central stations and industrial concerns are undertaking at the present time in remodeling their older plants.

Plant "A"—Steel Plant Remodeled

This plant had three boilers equipped with old dump grate type underfeed stokers. With the old plant with the three boilers in operation, it was possible to obtain continuously 61,500 pounds of steam per hour, and on a peak 81,600 pounds of steam per hour. It was decided to remodel the boiler plant and re-vamp the old stokers, changing them to a crusher type stoker, and with increased grate surface. The setting before and after remodeling is shown in Fig. 9. The new boilers are designed to give continuously about 100,000 pounds of steam per hour; on a peak 130,500 pounds of steam per hour. This will give a continuous increase of about 30,000 pounds of steam per hour and a peak increase of about 50,000 pounds of steam per hour.

The complete cost of re-vamping the old stoker fired boilers was about $65,000.00. This included new stokers, side and rear water walls, brickwork, excavation, complete erection and everything ready for steam generation. On this basis of cost, the additional steam figures $2.17 per pound per hour of steam continuously and $1.30 per pound per hour of steam for peak loads.

Plant "B"—Central Station Plant Remodeled

This is a central station installation having 14 retort 33 tuyere underfeed stokers installed under 1710 h.p. boilers. One of the settings is being remodeled by removing the 33 tuyere stoker and installing a 53 tuyere stoker, as shown in Fig. 10. The 53 tuyere stoker will have a 493 square feet grate surface, and additional grate area of 115 square feet. With the old installation, 200,000 pounds of steam per hour was obtained by burning 78 pounds of coal per square foot of grate surface per hour. With the remodeled setting an evaporation of 300,000 pounds continuously per hour will be obtained at the rate of 72 pounds of coal per square foot per hour. On a basis of burning 78 pounds of coal per square foot per hour, the new evaporation will be 330,000 pounds of steam per hour.

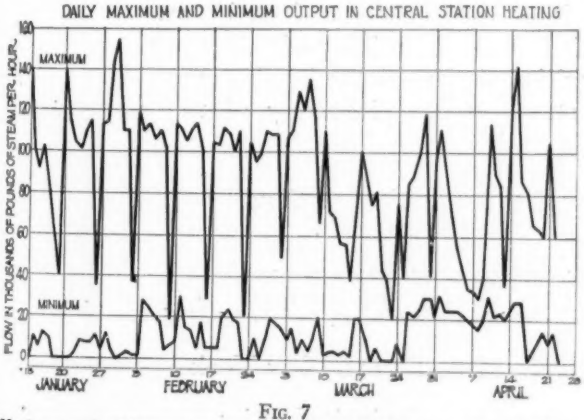


FIG. 7

Maximum and minimum steam output of Terminal Heating and Freezing Plant, Consolidated Gas & Electric Co., Baltimore, Md.

In the new stoker, all the furnace changes will cost approximately $150,000.00. Taking the 330,000 pounds of steam that the remodeled setting will give over the old 200,000 pounds of steam, the cost of this remodeling job will amount to $1.15 per pound of steam increase.

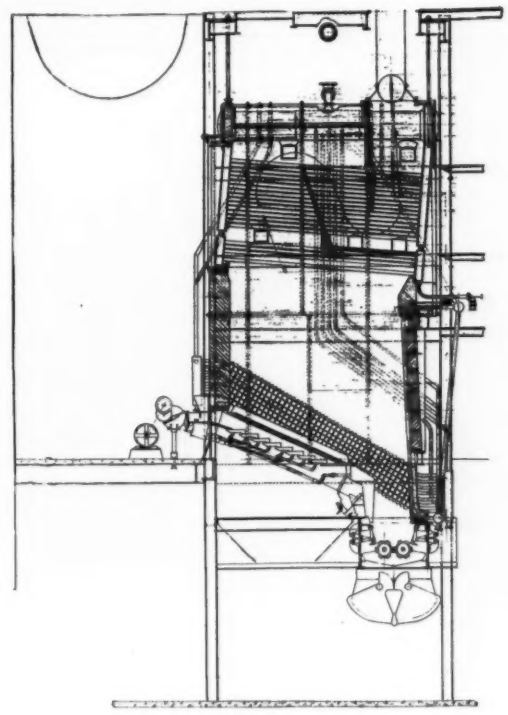


FIG. 8

Stoker setting of Terminal Heating and Freezing Plant, Consolidated Gas & Electric Co., Baltimore, Md.

Plant "C" Paper Mill Remodeled

This is a paper mill plant, having a total of 13 boilers equipped with old type overfeed stokers. It was decided to first start with the remodeling of one boiler and furnace, installing modern underfeed stokers. The original setting and the reconstructed setting are shown in Fig. 11. After the first boiler and stokers were reconstructed, tests were conducted, and it was decided to equip three more boilers making a total of four remodeled. After this, tests were conducted both on the old and the reconstructed installations. The old boilers had a total of approximately 145 square feet of grate surface each and this was increased on the new settings on three of the boilers to 161 square feet. The evaporation obtained on the old boilers was normally about 35,000 pounds of steam per hour, operating with an efficiency of 76 per cent. This was a gain in efficiency of 13.3 per cent.

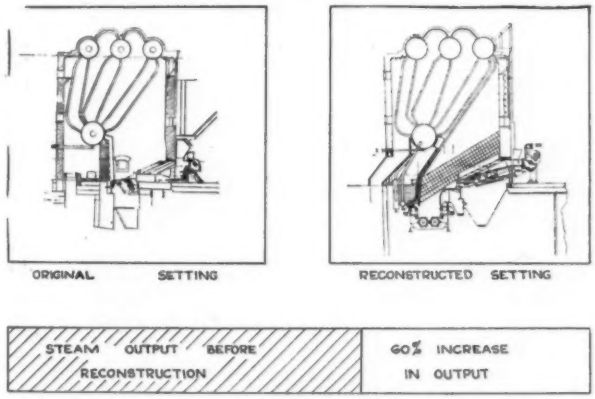
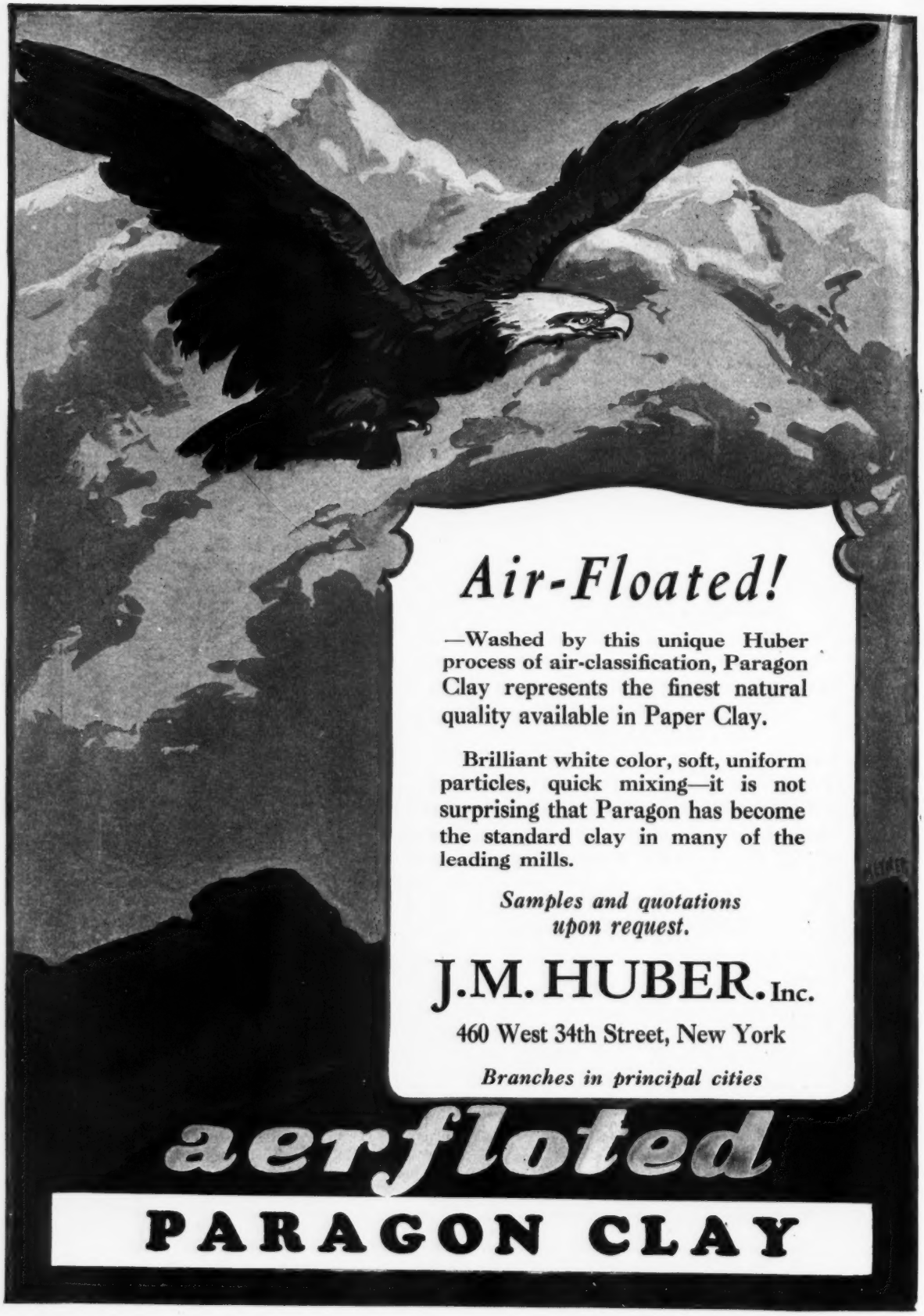


FIG. 9

Steel Plant boiler remodeled to give 100,000 pounds steam per hour.

The cost of re-building all of the four settings, including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foundations, brickwork, excavations, was $112,000. The saving per year on these four boilers, exclusive of maintenance, was $62,400.

Banking of Stoker Fired Boilers

The ability to bank an equipment over long periods with a minimum fuel loss is a reliability factor. Stokers having such flexibility also have ability to almost instantaneously meet any sudden peak demands without later interruptions in continued service. The amount of fuel that is burned under banked conditions is determined entirely by the tightness of the damper, boiler baffles and settings and has nothing whatever to do with the fuel burning process as such.

The fact that it is possible to have an inactive fire on the fuel bed ready to respond for any operating condition, does have considerable value as to the "use factor" of the entire unit.

One of our large central stations, the Richmond Station of the Philadelphia Electric Company, has recently operated with a very high load factor, while at other times, it is necessary to operate at a very low load factor. The boiler schedule is shown in Fig. 13 and a typical steam output chart is shown in Fig. 14.

The following figures show that the monthly efficiency of the plant was 68.1 per cent with 90.1 load factor, and compared with 85 per cent efficiency with a 39.7 load factor.

RESULTS OF RICHMOND STATION
PHILADELPHIA ELECTRIC COMPANY

High Load Factor August, 1929		Low Load Factor March, 1929	
Load factor	90.1	Load factor	39.7
K.w. hours	75,724,000	K.w. hours	31,762,000
Boiler efficiency	88.1	Boiler efficiency	85.0
Boiler hours			
Steaming	7,394	Steaming	3,217
Floating	89	Floating	99
Banked	293	Banked	1,595
Lighted	7,776	Lighted	4,911
Boiler factor	4.53 per cent	Boiler factor	50.3 per cent

$$\text{Load Factor} = \frac{\text{Peak (Instantaneous)}}{\text{Average Load}}$$

$$\text{Boiler Factor} = \frac{\text{Banking (+ ½ floating hours)}}{\text{Steaming (+ ½ floating hours)}}$$

Stoker Fired Large Steaming Units

The ability of the stoker to maintain maximum reliability which includes the factors of safety, usage and maintenance for extremely large steam generating units is becoming a very important consideration for modern plant design. Our usual past measure of success of boiler units by testing is going to be a very expensive and elaborate proceedure for these larger units. Tests too are generally run at constant rating on a certain grade of coal and where all conditions are established for the testing period.

The measure of success of these larger units is going to be determined by its everyday operating results and what it can produce in ratio to its cost. This will include not only the first cost but the maintenance cost.

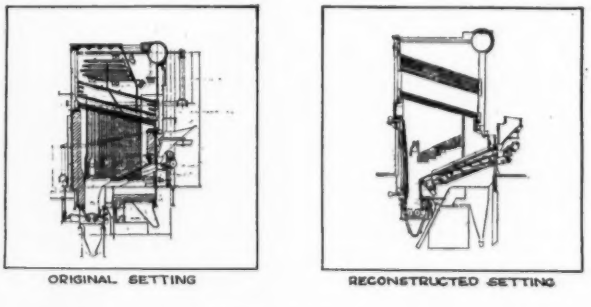


FIG. 10

Remodeling Central Station to give 330,000 pounds steam per hour.

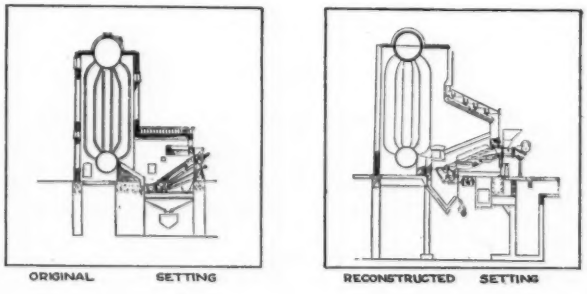


FIG. 11

Remodeling a paper mill plant to gain approximately 14 per cent in efficiency.

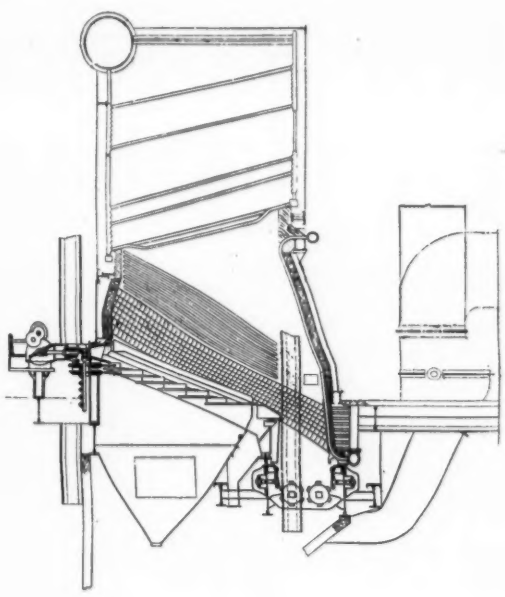


FIG. 12

Remodeling of a comparatively recent stoker installation to give an increase of 225,000 pounds steam per hour.

TABLE 1

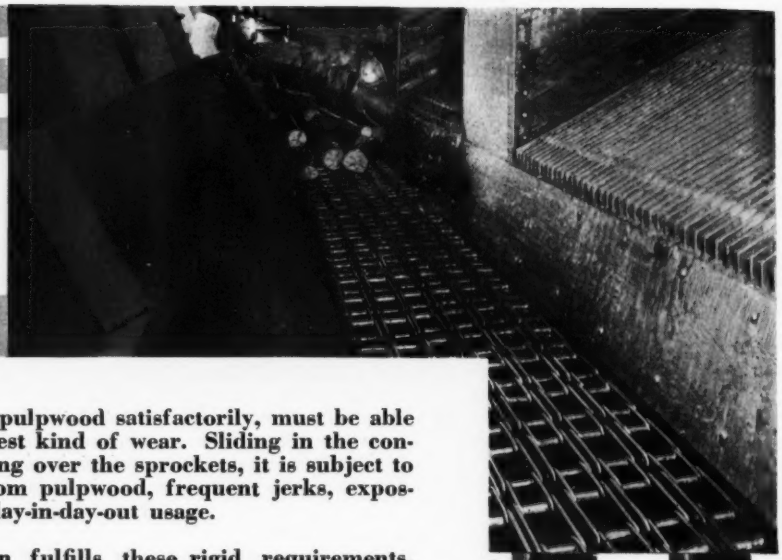
Station	Pounds of steam per hour per foot of furnace width Stoker fired plants Maximum	Continuous	Pounds of steam per sq. ft. of furnace area Stoker fired plants Maximum	Continuous
Delray	17200	12500	735	530
Bewag	17000	11400	835	555
Beacon St.	16700	6600	640	250
Hudson Ave.	15200	9000	770	450
Edgar	12500	9000	650	465
Cons. Htg. (Balt.)	8000	4900	420	260
Richmond	7000	4200	535	330

Table 1 shows the position the stoker is taking insofar as the pounds of steam generated per hour per foot of furnace width and also per square foot of furnace area.

It will be noted that the newer stations now under construction such as Delray No. 3 of the Detroit Edison Company in American and Bewag Station of Berlin, Germany, are designed to give higher steam output per foot of furnace width than anything now in

for conveying PULPWOOD

DEMAND
A CHAIN
THAT LASTS



SIX STRANDS OF JEFFREY HERCULES CHAIN CARRYING PULPWOOD TO CHIPPERS

Any chain, to handle pulpwood satisfactorily, must be able to withstand the hardest kind of wear. Sliding in the conveyor trough and riding over the sprockets, it is subject to constant pounding from pulpwood, frequent jerks, exposure to weather, and day-in-day-out usage.

Because it more than fulfills these rigid requirements, Jeffrey Hercules Chain is the most popular chain in the pulp and paper industry for conveying pulpwood. It is also used extensively on bucket elevators and as a drive chain.

The malleable block links of Jeffrey Hercules Chain are made with a hard skin for wear and a tough interior to withstand pounding. Strap links are .40 carbon steel. The barrel of the solid link provides a long pin bearing—extra metal being added where barrel engages sprocket tooth.

D-shank design of the high carbon steel pins provides *full diameter* pins that are locked in the strap link, thus confining all wear to the long block link bearing. Full diameter pins increase the strength of Jeffrey Hercules chains 25% over chains using milled pins.

Chain Catalog No. 480-E gives detailed information about all Jeffrey chain and attachments. Free on request.

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JEFFREY
MATERIAL HANDLING EQUIPMENT

operation. They also show the greatest steam output per square foot of floor area. Two of the later plants, the Edgar Station of the Boston Edison Company, seem to give the same continuous steam output per foot of furnace width as the Hudson Avenue Station of the Brooklyn Edison Company.

In some quarters, there comes a demand for one million, and even one and one half million pounds of steam per hour in one unit. If we take the Delray Stoker design and double up the setting as at Beacon Street, one million pounds of steam can be obtained.

Beacon Street Heating Plant Detroit Edison Company

The Beacon Street plant has no so-called heat recovery devises in combination with the boiler and stoker. It has no economizer, no preheater, no water walls, so that a study of the typical steam output curve as shown in Fig. 15, is interesting. It will be noted that over 350,000 pounds of steam is taken out of a unit on peaks.

The data that follows was taken from the operating records kept at the Beacon Street Plant. It illustrates the characteristic operation of the plant.

The boiler efficiencies shown are those derived from the weekly computations and are based upon the amount of make up water used as determined by an accurately calibrated V-notch meter.

BEACON STREET HEATING PLANT
BOILER OPERATING DATA—SEASON 1928-29

	Steam output as shown by boiler flow meter in thousands of pounds			Total boiler steam flow	Plant steam output V-notch meter	Quan. coal burned tons	Boiler eff. for month
	No. 1 boiler	No. 2 boiler	No. 5 boiler				
Sept.	.....	.....	9,758	9,758	8,209	471	78
Oct.	36,846	10,809	48,916	96,771	80,002	4,427	79.6
Nov.	42,676	100,261	60,150	203,087	164,789	8,870	81.4
Dec.	128,106	122,942	8,721	263,769	218,204	12,167	80.5
Jan.	122,257	114,009	131,189	367,455	203,365	16,323	80.2
Feb.	89,031	86,245	97,844	273,120	220,679	11,992	80.7
March	96,430	.....	92,164	188,594	156,940	8,469	82.7
April	33,710	85,519	31,676	150,905	129,210	6,806	83.2
May	11,298	103,941	.....	115,239	99,561	5,320	83.5
Total	560,354	623,726	480,418	1,664,498	1,370,959	74,845	

Note: From 15 to 20 per cent of all the steam leaving the boilers is used for feed water heating. The balance is the plant steam output.

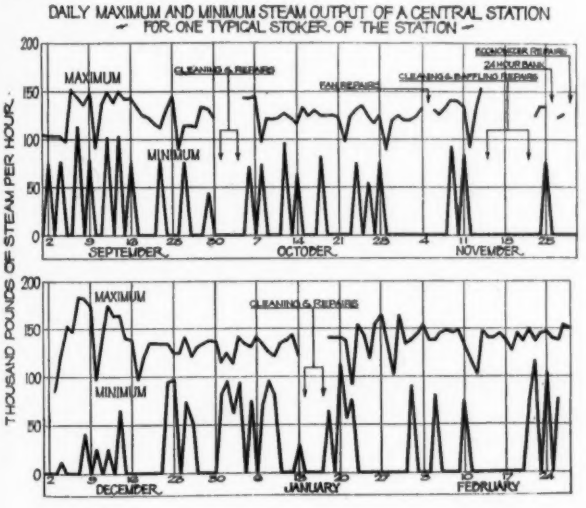

FIG. 14
Daily maximum and minimum steam output of Richmond Station—Philadelphia Electric Co.

BEACON STREET HEATING PLANT
HISTORY OF BOILER OPERATION—SEASON 1928-1929

Sept. 27, 1928—Plant started up. No. 1 boiler—induced draft fan repairs.
Oct. 12, 1928—Repairs to No. 1 induced draft fan complete.
Oct. 9-10-11—Plant down to make connections to No. 2 feed water heater.
Oct. 16, 1928—No. 5 banked to provide load for trial of No. 1 induced draft fan. No. 1 boiler put in service.
Oct. 24, 1928—No. 5 carried in reserve until this date—no repairs. Returned to service.
Oct. 24, 1928—No. 2 boiler induced draft fan bearing repair complete.
Oct. 29, 1928—No. 1 boiler down for repairs to main steam line. No. 2 boiler put in service.

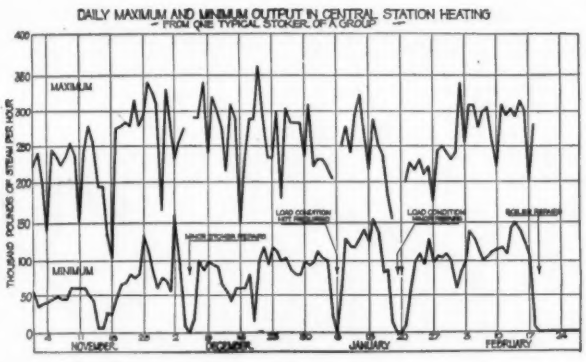

FIG. 15
Daily maximum and minimum output in Central Station Heating—Beacon St. Plant—Detroit Edison Co.

Nov. 2, 1928—No. 1 boiler steam line repairs complete. Boiler in reserve.
Nov. 20, 1928—No. 1 boiler in service. No stoker repairs in shutdown. No. 5 boiler removed from service for cleaning sifting hoppers, stoker repairs.
Nov. 26, 1928—No. 5 boiler repair work completed.
Dec. 2, 1928—No. 1 boiler banked 5 hours during night to remove side wall clinker.
Dec. 4, 1928—No. 5 boiler in service. No. 2 boiler out of service for stoker repairs.
Dec. 5, 1928—No. 2 boiler stoker repairs completed.
Dec. 6, 1928—No. 5 boiler out of service for boiler repairs. 53 water circulation tubes replaced and new baffle installed.
Dec. 10, 1928—No. 5 boiler repairs complete. Boiler in reserve.
Dec. 21, 1928—No. 5 boiler in service.
Dec. 22, 1928—No. 5 boiler out of service. Small plant load.
Jan. 2, 1929—No. 5 boiler in service.
Jan. 5, 1929—No. 2 boiler banked. Load conditions.
Jan. 7, 1929—No. 2 boiler in service.
Jan. 9, 1929—No. 1 boiler down. Stoker repairs and cleaning tubes exposed to fire.
Jan. 10, 1929—No. 1 boiler repairs complete. Boiler in reserve.
Jan. 12, 1929—No. 1 boiler in service.
Jan. 18, 1929—No. 2 boiler down. Load conditions and stoker repairs.

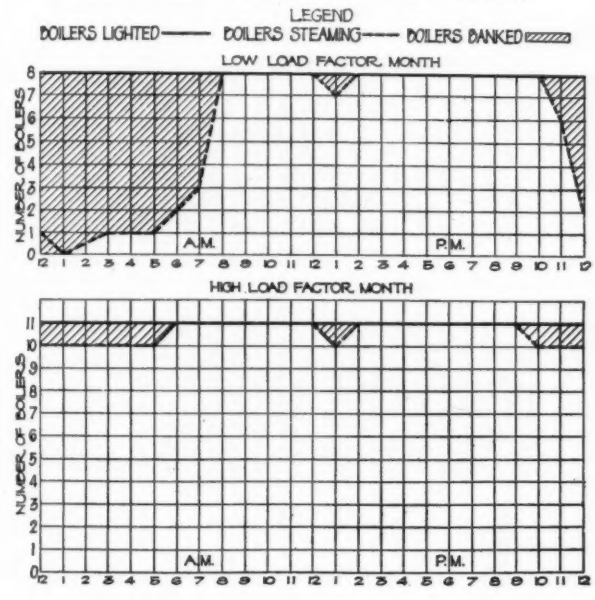

FIG. 13
Typical boiler schedule of Richmond Station—Philadelphia Electric Co.

Jan. 20, 1929—No. 2 boiler repairs complete.
Jan. 21, 1929—No. 2 boiler returned to service.
Feb. 2, 1929—No. 5 boiler down for boiler cleaning external surface and stoker repairs. Stoker repairs completed in one day.
Feb. 7, 1929—No. 5 boiler. All repair work complete.
Feb. 9, 1929—No. 5 boiler returned to service. No. 1 boiler down for general cleaning and stoker repairs. Stoker repairs required one day.
Feb. 16, 1929—No. 1 boiler all repairs complete.
Feb. 18, 1929—No. 1 boiler returned to service. No. 2 boiler down for general cleaning and stoker repairs. Stoker repairs required one day only.

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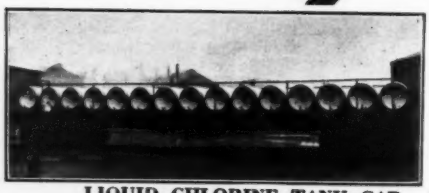

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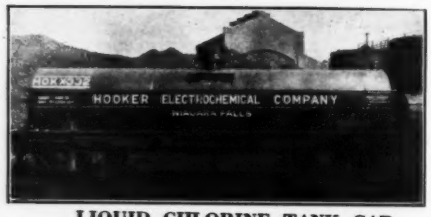

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Mar. 5, 1929—No. 2 boiler repairs complete. Boiler in reserve.
Mar. 24, 1929—No. 5 boiler banked 12 hours. Load conditions.
Mar. 30, 1929—No. 5 boiler removed from service. Not required to conform with schedule of boiler operation.
Apr. 4, 1929—No. 1 boiler banked to permit operation of No. 5 boiler and make stoker repairs.
Apr. 5, 1929—No. 5 boiler returned to service for test purposes. No. 2 boiler banked. Load conditions.
Apr. 10, 1929—No. 2 boiler returned to service. No. 5 boiler banked. In connection with experimental apparatus in boiler.
Apr. 11, 1929—No. 1 boiler in service.
Apr. 13, 1929—No. 1 boiler banked. Load conditions.
Apr. 15, 1929—No. 5 boiler returned to service. Continuation of test.
Apr. 21, 1929—No. 5 boiler down. Test work complete. Down for annual overhauling.
Apr. 21–
May 31, 1929—Boiler No. 1 used whenever plant load conditions permitted.

It will be noted that a total of seven (November 20th to Nov. 26th and Dec. 4th to 5th) days boiler outage may be charged to stoker repairs during the whole season of approximately $3 \times 240 = 720$ boiler days. This amounts to only $\frac{7 \times 100}{720} = 0.97$ per cent

At all other times the boiler was held off the line for reasons other than stoker repairs.

This and similar analysis indicate the surprising large number of elements affecting boiler outage. Engineers may well devote a great deal of study to the causes of boiler outage and means for reducing it.

The Mercerization Test*

By Th. C. Bentzen[1]

Value of Mercerization Test

Since the last time I talked about the mercerization test, many articles have been published, and the different viewpoints made it desirable for me to improve and simplify my method and make it serviceable. I shall now describe my method in its present form, but beforehand, to avoid misunderstandings, I want to premise that I do not pretend to regard the mercerization test as a test for permanence, but only as a test for the percentage of alpha cellulose.

Importance of Alpha Cellulose

I presuppose that you will agree with me that the alpha cellulose must be considered to be the only real paper making material in and of any kind of fibers, whereas, (as far as I have learned from experiments) the oxycellulose is acting as a filler which is disposed to weaken the paper, and the glucose, which in itself is worthless, goes direct into the white water. In this way, the percentage of alpha cellulose is the standard scale of the differing strength of the different kinds and grades of the fiber materials in question.

Test Conditions

As the accuracy of the result of the mercerization test, wherein we have to deal with very small parts, depends upon constant normal conditions with respect to humidity and temperature, it is, of course, preferable to perform the test entirely in an humidity room, but where this is not available, care must be taken that the conditions (humidity and temperature) for paragraph 14 in the following description are exactly the same as they were for paragraphs 1, 2, 3 and 4 and as close as possible to normal (65 per cent humidity by 70 deg. F.). The mercerization test and calculation is described in detail in the following 15 paragraphs.

Procedure

1. The fiber material in question must be exposed to air of normal moisture (65 per cent) by normal temperature (70 deg. F.) for 24 hours or if necessary longer, to "air-dry" constant weight and these normal conditions must, as close as possible, be maintained during the entire process.

2. With help of a Schroeter potato grater No. 100 (to be procured at any hardware store) about 5 grams of the air dry material is grated (without lumps or pieces) into a dish placed under the grater.

3. Tare a dry pyrex glass beaker, tall form (about 300 cc. capacity) and leave it upon the balance.

A so-called general laboratory balance or a prescription balance, (sensitiveness 1 milligram) is preferable. If the analytical balance is to be used, then a beaker, low form, about 200 cc. capacity and shorter forceps must be used, and the finished macerated pulp must then be washed into a larger beaker with help of 200 cc. of distilled water (see paragraph 4-8).

4. Place, with the help of a long forceps (about 200 mm. long). exactly 3.5 grams of the air dry grated pulp into the bottom of the beaker, carefully preventing the pulp from sticking to the wall of the beaker.

5. Add a solution of 47 cc. sodium hydroxide solution 27 per cent (standard purchasable reagent) diluted with 25 cc. distilled water, which gives a strength of 17 per cent. This solution should be prepared in due time to cool off to normal before used.

6. Stir until the entire pulp is mixed with the solution. This must be done carefully but as quickly as possible.

7. Let the beaker with the contents stand at normal temperature (70 deg. F.) for one hour, then carefully stir it.

8. Dilute with about 200 cc. distilled water.

9. Filter through a piece of linen of known weight, placed in a pyrex glass separatory funnel (shape 60 deg. and diameter 6 inches) which with help of a one hole rubber stopper, is fastened air tight into a pyrex glass Erlenmeyer flask with side neck (capacity 4000 cc.), connected with a Harrington filter pump, which (besides being very cheap) will never suck back.

10. Drain as far as possible.

11. Wash the fibers upon the filter with water of various temperatures, until no traces of alkali can be detected.

12. Drain and soak the fibers upon a filter with diluted acetic acid. (4 cc conc. acid in 96 cc distilled water).

13. Wash repeatedly with hot water and rinse with cold water.

14. Drain, bring to air dry weight. The weight minus the known weight of the filter is the weight of the alpha cellulose.

15. Calculation:

$$\frac{\text{Weight of alpha cellulose} \times 100}{3.5 \times (\text{the weight of the sample})} = \text{percentage of alpha cellulose.}$$

Quantitative Test Only

This test is only capable of indicating the quantity of the alpha cellulose present, but it is not suitable to proving the quality. It is not able to prove which of different tested fibers have the greatest physical strength.

Many years of experience has taught us, that of all kinds of fiber materials, linen and cotton possess this physical quality of strength to the highest maximum, at the same time as it contains the highest percentage of alpha cellulose, and this means quality combined with quantity.

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 18, 1930.

[1] Member TAPPI, Chief Chemist, Whiting-Plover Paper Co., Stevens Point, Wis.

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Clothes Lines

Corrosion Resisting Alloys for Pulp and Paper Mills*

By Walter M. Mitchell[1]

The selection of metals for the construction of plant equipment for use in handling corrosive materials is a problem affecting many processes and is always one of extreme importance. In a way it is a kind of perpetual problem for with the development of each new process it must be solved all over again before the process can become a commercial success. When chemical industries were in their infancy and relatively small units of equipment sufficed the question of materials of construction was more easily solved. Conditions where corrosion was extreme could be satisfied by stoneware and other vitreous materials. But with the inception of large scale production and the development of the newer synthetic processes the situation has become more acute and vitreous or similar materials are found no longer to possess the strength and toughness required.

The demands of chemical industries have been a powerful stimulus to the metallurgist, who, we are glad to say, has been able to respond promptly and has produced metals which in numerous instances have fulfilled virtually all requirements. The success of high nickel-chrome steels for ammonia synthesis and the stainless irons for manufacture of nitric acid are well known instances of this. These metals have revolutionized the manufacturing processes for those products. In other cases, however, the metallurgist has not been so successful and there are many demands of chemical industries not yet satisfied.

Each alloy developed has its own field of usefulness beyond which its use is not recommended. One inconvenient feature is that high resistance to corrosion frequently goes hand in hand with undesirable mechanical qualities; so that, while an alloy may be very good in one respect, it is not so good in another. In such cases a compromise is necessary, resulting either in sacrifice of corrosion resistance or the willingness to carry on with equipment designed to satisfy the idiosyncrasies of the metal rather than the plans of the designing engineer. It is rarely that a pure metal is capable of fulfilling all requirements. This is very apparent when the demands of chemical industries are considered. In consequence an extraordinary number of combinations of metals has been produced with the hope of developing something that will meet in a satisfactory manner at least some of the requirements.

Combinations of metals can be very widely, but sharply, divided into two classes: The true alloys, that is, those forming solid solutions in which free metallographic constituents do not appear; and those in which free constituents, such as carbides, eutectics, intermetallic compounds, etc. are present.

Corrosion Phenomena

Just what the actual mechanism of corrosion is appears still very much a subject for discussion. In the case of a pure metal it may be regarded as a result of what may be called the "unsatisfied affinity" of its atoms for the stranger atoms of some other substance, and this determines the energy with which it will combine with this substance, generally displacing some other element with which the stranger atoms have previously been in combination. If it is possible to reduce this unsatisfied affinity that which we call corrosive attack will be diminished. This may be done, as in the formation of an alloy, by the addition of some other metal, usually less reactive, which forms a solid solution with the first. In such case susceptibility to attack will be considerably reduced. If this energy of affinity is still further reduced by the addition of a third metal in the solid solution there will be still greater resistance to attack, and so on.

This is well illustrated by a number of alloys. Iron is readily attacked by oxygen, even at normal temperatures. The addition of chromium, which forms a solid solution, as in stainless irons, produces practically complete resistance at ordinary temperatures and even at moderately elevated temperatures. If a third metal, such as nickel or silicon, is added in proper proportion, which also enters solution with the iron and chromium, resistance to oxidation is extended to still higher temperatures, and the alloy is unattacked by a number of materials, which attack both the plain iron and the iron chromium alloy.

It is now well recognized that the solid solution type of alloy is not only inherently more corrosion resisting, but is also better from the mechanical standpoint, for such alloys almost invariably possess the highest physical properties of strength and toughness of any alloy of the series.

In the second group of alloys, which are merely mechanical mixtures of the various constituents, action due to potential differences will take place between the constitutents themselves, and in consequence this type of alloy is not the most desirable for corrosion resisting purposes.

Considering metals and alloys as a whole, the character of resistance to attack is dependent very largely on the inherent chemical affinity of the metal, or perhaps better, the reciprocal of the affinity, the inertness to certain other elements, the most important of which are oxygen, sulphur, and the halogens, and upon the degree to which this inertness may be increased by admixture of other alloying metals. Thus, in a metal inherently resistant to acids, resistance will be increased by the addition of silicon; and similarly, increased resistance to oxidation will be obtained by additions of chromium, and so on. In alloys used in manufacture of sulphite pulp we have seen illustrations of this in applications of the metal lead. Lead is resistant to sulphur dioxide and is found to notably increase resistance of bronzes to which it is added in increased proportions. In any case, however, the useful combinations which may actually be produced are limited by the solid solution forming ability of the metals themselves.

In addition to the characteristics of the metal itself other factors profoundly influence corrosion attack. These may be classed as contributing causes and include temperature, rate of agitation, oxygen content, formation of protective films, etc. These factors are closely dependent one on the other, and the degree to which any one enters will readily be affected by the influence of some other. Such interdependence accounts for the complexity of the corrosion problem, and explains the difficulty of tracing through to their ultimate causes definite cases of corrosive attack.

Corrosion in Paper Mills

In the various phases of the manufacturer of pulp and paper the chief field for corrosion resistant alloys is for equipment for manufacture of sulphite pulp. Other pulp processes and the manufacture of paper itself appear to be comparatively free from unusual difficulties because of corrosive attack. Metals and alloys employed in the manufacture of sulphite pulp are

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 19, 1930.

[1] Asst. sales manager, development dept., Central Alloy Steel Corp., Massillon, Ohio.

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The Stratton Vertical Jet Furnace burns *crushed* (not pulverized) coal, in suspension, smokelessly and without fly-ash.

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lead, copper, copper alloys, such as bronzes, etc., chrome-nickel, and chrome-nickel-molybdenum stainless alloys.

Lead, as is well known, is used for coolers for sulphur dioxide and appears to give satisfactory service. It has the advantage of being low in cost and is easily fabricated. Bronzes are used chiefly as castings for pipe fittings, valves, nozzles, strainers, etc. The use of bronzes has been established because of the good quality of castings obtainable and because it has fair resistance to sulphurous acid, at least better than many other metals. Compositions, as far as it has been possible to ascertain, vary from the familiar 85:10:5 to high lead bronzes with 70% Cu, 5½% Sn, 5½% Sb, and 19% Pb. Another composition in considerable repute is 90% Cu, 9½% Sn, ½% P. Both antimony and lead are desirable additions and increase resistance to sulphurous acid, although the addition of a high percentage of lead is accompanied by increased casting difficulties. Bronze castings show a life of a few weeks to a year depending upon analyses and service conditions.

Copper tubing 6 inch extra heavy I. P. S. is used extensively in Canada for acid supply lines. It does not appear to be particularly satisfactory as it seldom lasts longer than a year.

Chromium Alloys

The most interesting alloys for use in the manufacture of sulphite pulp are the chrome-nickel and chrome-nickel-molybdenum alloys produced under Krupp-Nirosta patents and generously classed with the stainless irons and steels. Chrome-nickel alloys of the 18-8 type, such as Enduro KA2 and Allegheny metal are considerably more resistant than bronzes and are reported as giving at least twice the life of bronze; but as bronze analyses are not specified this is rather an indefinite recommendation. At all events it appears unquestionable that the chrome-nickel alloy is distinctly the better metal. The 18-8 composition appears to be generally satisfactory for cold sulphur dioxide and sulphurous acid, but if resistance at elevated temperatures is desired molybdenum must be added. From all information available to the writer the chrome-nickel-molybdenum combination 18-8-3, such as Krupp's V-4-A or its American equivalent, Enduro KA4 is entirely satisfactory from the corrosion resisting standpoint. This alloy as manufactured in Germany and duplicated in the United States has been tested in numerous plants and all reports on its service are satisfactory. It is a workable metal and has been produced in virtually all forms, as castings, sheets, plates, bars, seamless drawn tubing, etc.

Metallurgically considered the chrome-nickel and chrome-nickel-molybdenum stainless alloys of this type are all austenitic. To the metallurgist this pictures an alloy of the solid solution type with no capacity for hardening by heat treatment, hardening being produced by cold mechanical working only, high toughness and ductility, and the property of being non-magnetic.

To put alloys of this type into best mechanical condition and to insure greatest corrosion resistance; that is, to make them fully austenitic, they must be heat treated by heating to a high temperature, 1900 to 2100 deg. F. for the chrome-nickel, and 2000 to 2200 deg. F. for the chrome-nickel-molybdenum, and cooled rapidly.

The chrome-nickel-molybdenum alloy, such as Enduro KA4, shows physical properties closely similar to the 18-8 analysis, as would be expected. Physical properties of heat treated bar stock are as follows:

Tensile strength	86,000 pounds per square inch
Yield point	42,000 pounds per square inch
Elongation in 2 inches	62 per cent
Reduction of area	70 per cent
Brinell	140 to 153
Izod	113 to 115 foot pounds

Considerable variation in carbon content may be found in commercial varieties of these alloys, which may run as high as .20 or .25 per cent. This is not particularly desirable as higher carbon results in greater precipitation of carbides at temperatures of 1300 deg. F. to higher, resulting in lessened ductility. This will be emphasized if the metal is in condition of mechanical strain when heated.

The chrome-nickel-molybdenum analysis appears to show recrystallization at 1800 to 1900 deg. F. with absorption of carbides becoming more or less complete at about 2000 deg. F. At higher temperatures, that is at 2300 deg. F., a secondary crystallization appears to take place with greatly increased grain growth. So far insufficient experimental work has been done on this alloy in this country to state the above recorded data to be facts; all that can be said at present is that such appears to be the case. It should be noted that we are dealing with a very complex alloy, containing in addition to the original iron, important percentages of chromium, nickel, and molybdenum, the variation of any one, or several, of which elements will undoubtedly be accompanied by variations in metallurgical characteristics, the effects of variations in carbon being particularly pronounced.

Fabrication Factors

Just how great this effect will be and to what extent the usefulness of the metal will be altered will depend upon methods used for fabrication, whether welding or riveting. Welding is obviously the more convenient and more suitable for fabrication of smaller and more intricate pieces of equipment. Either the electric arc or acetylene process may be used, rods being of the same composition. Riveting has some advantages over welding, particularly where heavy plates are to be joined and where corrosion resistance and strength are concerned.

In welding it has been our experience that alloys of this general character are more liable to failure by cracking if carbon content is high than if low, this is doubtless due to decreased ductility through precipitation of carbides in heating and a condition of strain induced through thermal expansion and contraction. Heat treatment should always follow welding. This is particularly important if the metal is high in carbon.

As these metals become hardened by "cold work" at temperatures of 1700 deg. F. or less, it is important that rivets be driven sufficiently hot for upsetting to be completed before the rivet becomes cold worked to any degree. There is probably no test other than a destructive test that may be used to investigate welds, rivets, etc. to determine whether or not the metal is in safe condition. The only assurance in such cases is to observe proper fabrication methods.

In parts which do not require extensive fabrication the alloy V4A or KA4 may be used without hesitation. Valve stems, for instance, may be produced from bar stock. In installing these it is advisable to avoid contact with copper alloys or with graphite because of electrolytic action which is likely to take place at the expense of the chromium alloy.

In producing castings it is necessary to raise the carbon content somewhat in order to produce a sounder metal. As a rule, highly alloyed ferrous metals are difficult to cast satisfactorily if carbon content is maintained low. If carbon is too high, however, corrosion resistance may be affected and the alloy becomes so hard that it is impossible to machine it. Thus, the necessity for holding carbon as low as is consistent with the production of sound castings. Even at best a coarse open grained structure is likely to result. The large coefficient of expansion tends toward piping and cracks so that the mechanical quality of castings leaves much to be desired. Being austenitic these alloys cannot be heat treated as ordinary carbon steel. In consequence the original casting structure cannot be eliminated by any means other than mechanical working. Proper foundry

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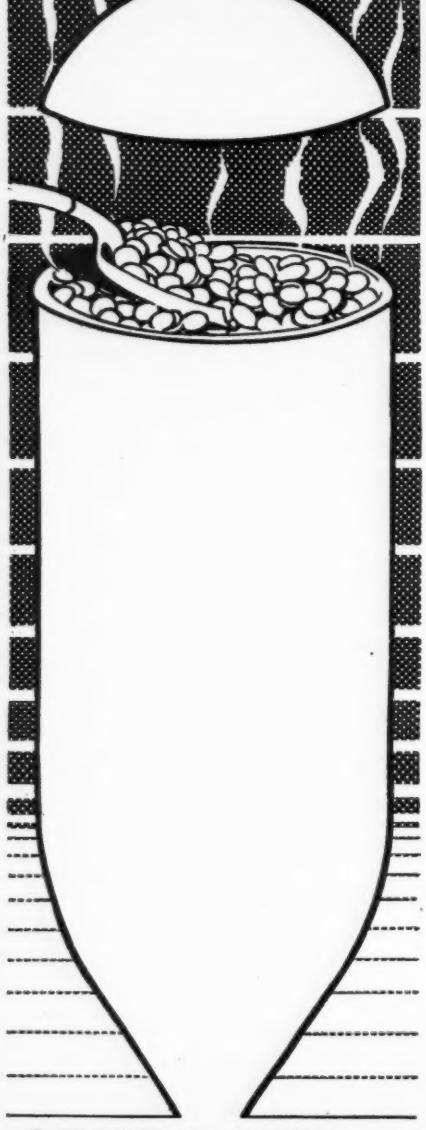

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practice and pouring temperatures are very important and castings of at least fair quality should be obtainable without great difficulty.

If it is possible to produce the desired part by forging, this is preferable, as a forging properly made and heat treated will have far better crystalline structure and physical properties than any casting.

Sheets and plates are produced in ordinary sizes without difficulty and are of good quality. They are suitable for blowpit bottoms, screen plates, etc. The question of perforation is still a little uncertain, but it is believed that this can be successfully done. Such bottoms should be free from the objections of perforated wood or tile bottoms. They should not only withstand corrosion but erosion by the pulp as well.

Seamless drawn tubing for acid lines is available in the KA4 analysis in sizes up to 5 inches I. P. S. Larger tubing must at present be fabricated by welding sheets or plates together. Piping over 10 inches in diameter may be riveted. Tubing of straight chromium analysis fabricated in this way is being used for nitric acid manufacture and is giving excellent service.

As the chrome-nickel-molybdenum analysis is so satisfactory from the corrosion resisting standpoint and as tubing is available it should be possible to develop heat exchangers whereby the heat of relief steam would be utilized to preheat acid before its introduction into the digester. It is believed that considerable economy in operation would result from installation of suitably designed equipment of this character. In addition the problem of disposal of waste liquors in thickly settled communities would be considerably simplified by construction of evaporators made of KA4 tubing.

Seamless drawn tubing should be expanded for Van Stone joints and subsequently heat treated. Flanges which are welded should also be heat treated. If the carbon content is low, heat treating one end of a tube will not injure the balance of it.

Centrifugal Castings

Centrifugally cast tubing of large size is a commercial possibility in the near future. Bronzes, cast iron, monel metal, etc., have been successfully cast in tube form by this method and there appears no reason why chrome-nickel-molybdenum alloys cannot be similarly handled. The structure and physical properties of centrifugally cast metal are notably better than in still castings. Sizes in bronze tubing have run up to 24 inches diameter and 20 feet long. It may also be possible to cast flanges integral with the tube itself thus doing away with welding or expanding. Tubing of this character will be very suitable for blow lines, and should give much longer life than the cast iron pipe now in use.

Digester Construction

The fabrication of a full size digester of chrome nickel molybdenum alloy is not an impossibility. Riveting is to be preferred to welding as a means of construction because of the obvious impossibility of heat treating any piece of equipment the size of a digester after fabrication. To avoid questionable quality in the metal itself and possible undesirable results of fabricating procedure, very low carbon should be specified for both plates and rivets. Further, both the plates and the rivet material should be heat treated before fabrication. The chief advantages of an alloy digester will be the material reduction in corrosion troubles and the elimination of the brick lining.

Committee on Abstracts And Bibliography*

Clarence J. West, Chairman[1]

During the year 1929, the following contributions from the Committee on Abstracts and Bibliography appeared in the columns of the Technical Section of the PAPER TRADE JOURNAL:

ABSTRACTS: During the past year there appeared 71 pages of abstracts, as compared with 66 pages in 1928, 65 pages in 1927, 107 pages in 1926, 77 pages in 1925 and 78 pages in 1924.

The Chairman wishes to express his appreciation of the very faithful services of the other members of the Committee, Mr. A. Papineau-Couture and Mr. C. E. Peterson, who bear the burden of the abstracting; Mr. J. F. Ohlson is a recent addition to the abstracting staff and will take care of German publications and patents.

BIBLIOGRAPHIES: The annual bibliography for 1928 appeared in the Convention Number of the Paper Trade Journal (Feb. 21, 1928, p. 173-231) and in the Technical Association Papers XII:147-177. The reprint in the Association Papers carried an author index. This bibliography for 1929 is submitted as a part of this report.

The annual supplement, covering the activities of the Paper Section of the Bureau of Standards, appeared in the Paper Trade Journal for April 18, 1928, p. 57.

A list of the publications of the members of the Forest Products Laboratory from the date of its establishment, 1910, until Dec. 31, 1928, was compiled with the cooperation of the Laboratory and appeared in PAPER TRADE JOURNAL for July 4, 1929, p. 56-62.

INDEXES: The semiannual indexes of the Technical Section (vols. 87 and 88) have been published during 1929. The index for vol. 89 has been published this year in the Paper Trade Journal.

PATENTS: A classified list of the United States Patents on papermaking for 1928, using the system of classification adopted by the U. S. Patent Office, appeared in Technical Association Papers XII:191-195. During 1929, there have appeared quarterly chronological lists in the PAPER TRADE JOURNAL for Feb. 7, Apr. 11, Aug. 1 and Oct. 24. The complete list for 1929 will appear in vol. XIII of Technical Association Papers.

Bibliography of Pulp and Papermaking, 1900-1928

Since the Bibliography of Pulp and Paper making bears the copyright date of 1929, we may be pardoned for again calling the attention of the Association to this work. Imperfect though it may be, there is no other source of information which gives as complete a survey of the periodical literature of the world relating to the pulp and paper industry.

Patents

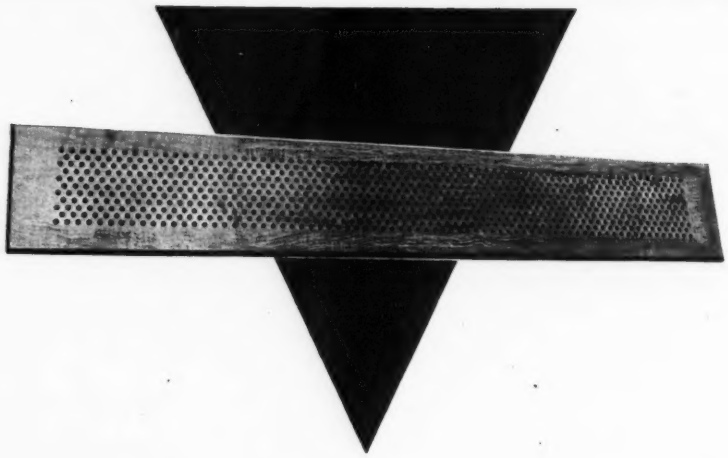
The Chairman has taken occasion to discuss with some of the members the desirability of preparing a companion volume to the bibliography, which would cover the United States patents on papermaking from the founding of the patent office to the present. While the value of the work is not doubted, there is a serious question as to its value as a publishing venture. The work that Mr. Rossman is doing would form a basis for such a compilation, but active work certainly will not be started until there is some indication that the venture would be successful to the publishers as well as to the compilers.

Requests

Many requests have come to the Chairman, especially for photostats of articles not available to the members of the Association. These have been handled as promptly as possible.

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 18, 1930.

[1] National Research Council, Washington, D. C.



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Vertical Jet Combustion in the Paper Industry *

By Douglas Henderson[1]

Five years ago, February 1925 to be exact, a plant in Western New York State identified with the paper trade placed in operation a steam boiler that was fired with a rather unusual type of furnace. The method of burning coal in this furnace was unlike that employed by any existing combustion equipment, and quite naturally, its operation was watched with considerable interest.

The results obtained were so startling and so convincing that after one year's operation another furnace was ordered and installed to replace existing coal burning equipment. Still later a third furnace was installed at the same plant. The furnaces were Stratton vertical jet furnaces and the plant was the U. S. Gypsum Company, at Oakfield, N. Y.

In the boiler room there are three 508 horsepower boilers and each is fired with a Stratton furnace. Fig. 1 is a view of the boiler house showing the three individual stacks and the clear condition of these stacks is typical of the operation at this plant. The paper mill is adjacent to the boiler house, and smokeless operation without fly-ash is absolutely imperative. The five year record bespeaks of success in this regard.

Upon entering the boiler room, a view of the boilers and furnaces from the firing floor is obtained as shown by Fig. 2. For a better understanding of the furnace construction and operation, we will have to refer to a cross sectional view. Fig. 3 represents the Stratton furnace installed under a straight tube water-tube boiler. The furnace is rectangular in shape with the walls converging at the bottom to a hopper shape, at which point is located the Stratton throat unit. The throat unit is made up of cast iron sections through which air for combustion circulates, and below

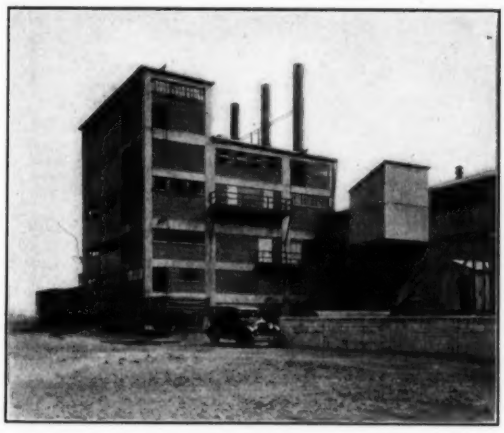

FIG. 1
U. S. Gypsum Co. plant at Oakfield, N. Y.

these castings are two sets of reciprocating grates, so designed that their motion provides for continuous ash removal.

The air enters the throat castings from the forced draft fan and circulates around the throat, discharging into a plenum chamber as shown by the darts. The pressure maintained in this chamber is about 0.4 inch of water, and the only outlet for the air is through the slot between the main grates, thus developing the vertical jet. The air is preheated to a certain extent by taking up heat from the throat castings.

Coal Feed

Crushed (not pulverized) bituminous coal is fed to the furnace at any desired rate, by a small drag chain conveyor supplied from the service hopper above it. The coal enters the furnace by gravity.

The smaller particles of coal, propelled horizontally into the furnace by a small auxiliary air supply, are burned immediately in suspension. The larger pieces drop towards the throat, are coked, and burned in suspension, supported by the vertical jet of air entering through the throat, at the bottom of the furnace. The ash, because of its greater density, falls to the throat, where it is discharged into the ash pit below.

The result is high average CO_2, no CO, and a low ash-pit loss

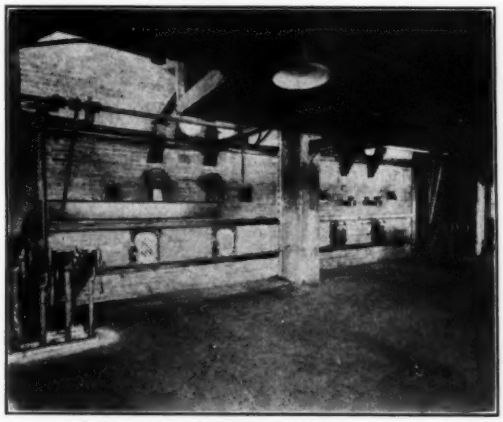

FIG. 2
Three 508 h.p. boilers equipped with Stratton furnaces at U. S. Gypsum Co., Oakfield, N. Y.

at all ratings within the normal operating range for which the furnace is designed. The most favorable conditions for efficient heat transfer to the boiler are secured by the low velocity of the gases at the top of the furnace, and the large radiant area exposed in the tubes.

The coal feeder and grate mechanism are operated by the drive stand control mounted in front of the boiler. Fig. 4 shows this equipment. It is driven by a 3/4 horsepower motor through a Reeves variable speed control and gear reductions. The handles on the drive stand control permit adjustment of the slot between the grates, and also make it possible to open the grates to the maximum opening of the throat.

Fig. 5 shows the two sets of reciprocating grates and the slot between the main grates. It also shows the cast iron sections through which the air circulates. Fig. 6 is another view of the throat unit and gives an idea of its compactness. The unit is shipped assembled ready for mounting on foundations previously prepared.

Principle of Vertical Jet Combustion

With these pictures of the apparatus in mind, it is of interest to understand the principle of vertical jet combustion. If a stream of finely pulverized coal were introduced into a swiftly moving vertical current of air, it is easy to see that these small particles would not only be supported, but rapidly elevated. If this experiment were conducted at the base of a tall chimney, the coal would be carried out the top.

If, however, the size of the particles of coal is gradually increased, or the velocity of the vertical current of air decreased, a point of equilibrium will be reached at which the individual particles will be supported, but not elevated. Furthermore, if the

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 19, 1930.

[1] Vice President, Stratton Engineering Corp., 116 East 18th St., New York, N. Y.

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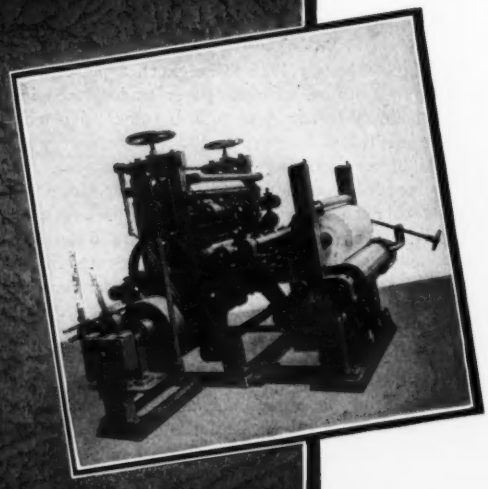

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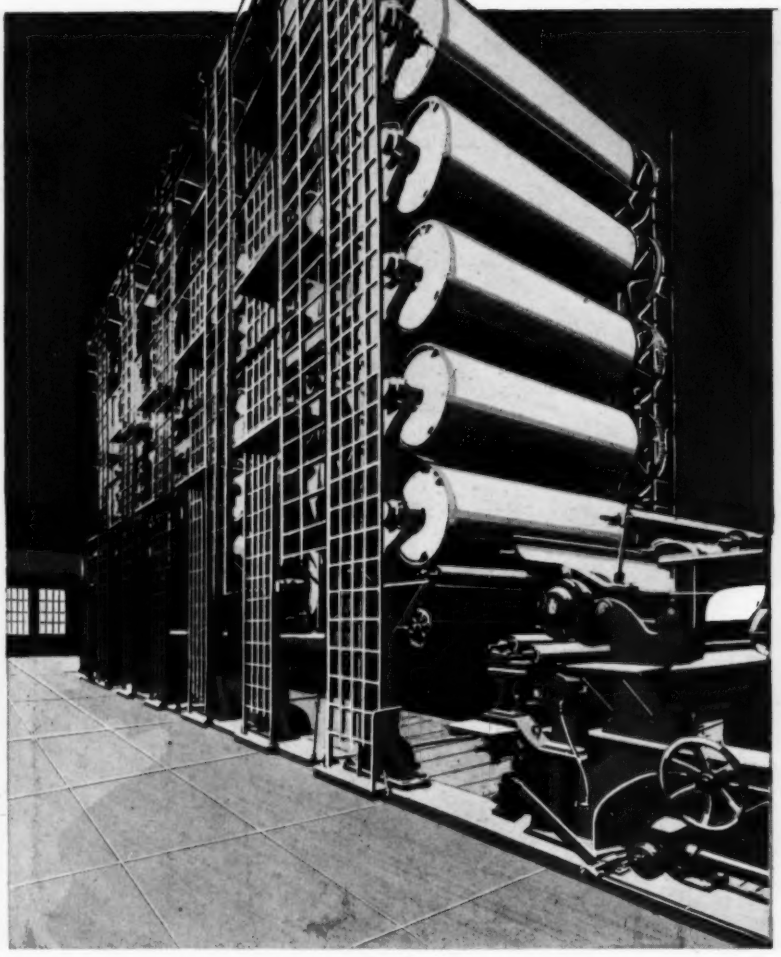

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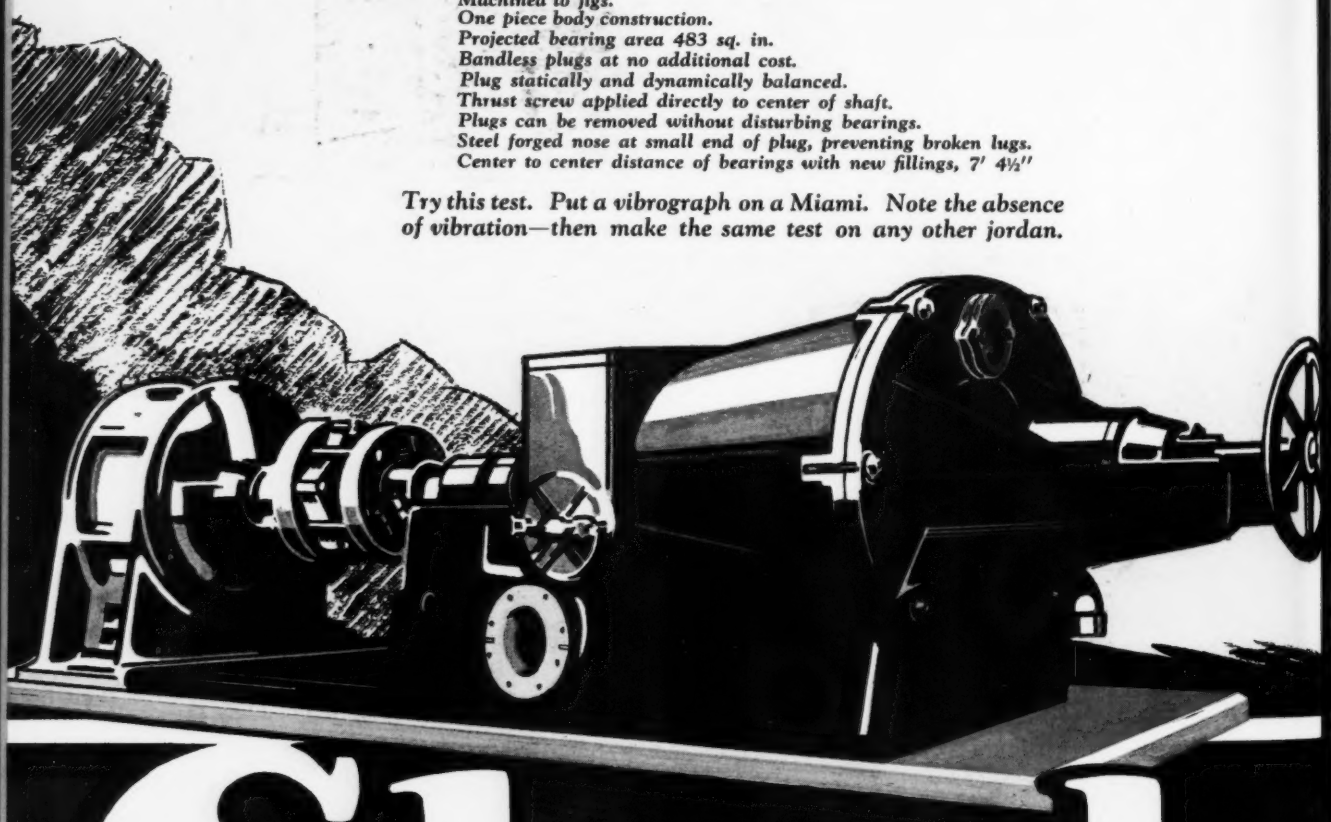

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density of the coal particle is reduced by coking, the velocity of the air current needed to support it can be still further reduced.

It is obviously a difficult and costly process to produce coal particles of uniform size. If the desired size is large, the smaller sizes incidentally produced by breakage become a waste product for which some other method of utilization must be devised. If the desired size is very small, for example small enough to pass through a 200-mesh screen, considerable machinery for grinding must be maintained, and a very substantial amount of power must be consumed.

It is a fact that bituminous coal, if crushed by the simplest type of crusher, breaks down to a variety of sizes, and even though our American coals vary considerably in their friability, minor adjustments in the crusher produce a surprisingly uniform gradation of sizes. For example, sizing tests on a very friable low volatile coal, and on a hard high volatile coach, crushed for use in the Stratton furnace in two different plants are shown in Table 1.

TABLE 1
SIZING TESTS ON CRUSHED COAL

	Friable, low volatile coal	Hard, high volatile coal
Over ¼"	8.8%	2.6%
Through ¼", over ⅛"	35.2%	35.9%
Through ⅛", over 30 mesh	22.0%	20.5%
Through 30 mesh, over 50 mesh	13.2%	23.1%
Through 50 mesh, over 100 mesh	9.9%	5.1%
Through 100 mesh	10.9%	12.8%
	100.0%	100.0%

Therefore, since the easiest and cheapest way to prepare coal is in this variety of sizes, if a combustion chamber is provided in which a proportionate gradation in the velocity of the upward current of air at different levels is maintained, all of the different sized particles will be supported at some point until they are completely burned. As a practical matter, what happens is that

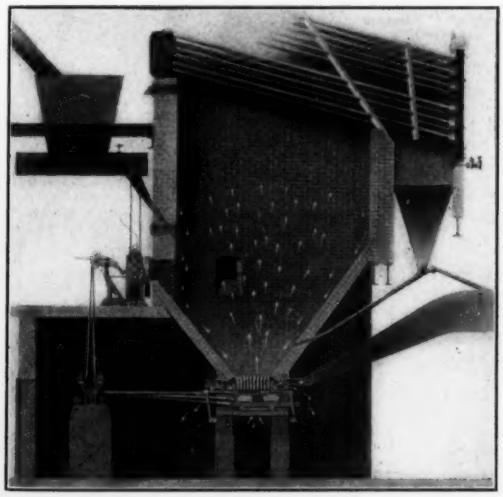

FIG. 3
Cross-sectional view of Stratton furnace.

each particle is constantly changing its size, first as it cokes upon entering the furnace, and later as it is burned.

The result is constant motion of every particle, as it seeks a point of equilibrium, producing a high degree of turbulence, which is an ideal condition for perfect combustion. In addition, each particle, regardless of its size, is retained within the furnace at some point until it is burned.

The residual ash has a greater density than any of the particles of coked coal, and can descend through the incoming vertical current of air.

The practical result of this variety of coal sizes and the varying velocities at different levels in the furnace is that the whole interior of the furnace is incandescent, and effectively used for combustion. At the same time a large radiant zone, favorable to the maximum heat transfer by radiation, is obtained while the velocity of the hot gases is at a minimum as they enter the heat absorption zone.

The close adjustment of coal and air, independent of each other, makes it possible to maintain an average of at least 14 per cent CO_2, and the thorough mixture within the incandescent furnace prevents the formation of CO at any combustion rate within the

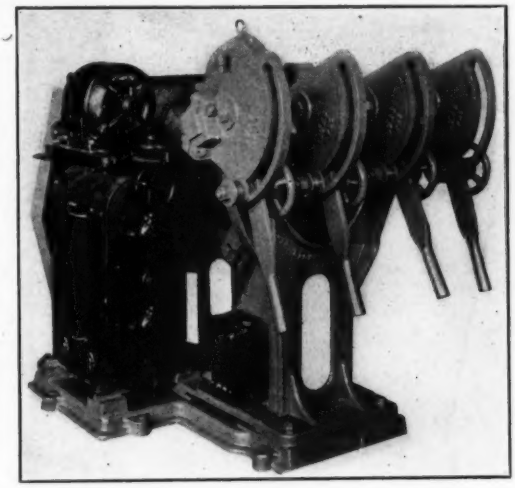

FIG. 4
Drive stand control.

normal operating range of the boiler and furnace. Fig. 7 shows CO_2 charts from two Stratton furnace installations under ordinary operation by regular firemen. The lower one represents a 12 hour night shift and the fireman on duty at that time had less than three weeks experience with a Stratton furnace. The boiler was operating at an average of about 160 per cent of rating.

Due to the low velocity of the gases in the upper portion of the furnace, combined with the fact that coal crushed for the Straton furnace normally contains an almost negligible proportion as small as 200 mesh, there is no tendency to slag formation on the boiler tubes.

Records of Performance

For the past year another company affiliated with the paper industry has been operating two Stratton furnaces. It is the Continental-Diamond Fibre Company at Bridgeport, Pennsylvania. In this case the boilers are straight-tube Heine units of 435 horsepower capacity. Fig. 8 gives a very good picture of this installation. The coal feeders with the bifurcated spouts are clearly shown, together with the instruments mounted in front of the boilers. Each boiler is equipped with draft gages, flowmeters with flue gas temperature record, and CO_2 recorder. The pressure and temperature of the steam is also recorded. The indications of these instruments keep the fireman informed as to combustion conditions in each furnace, together with necessary information regarding boiler performance.

A view of the furnace looking down at the throat unit is seen in Fig. 9. The openings at the left are the inspection doors, and the coal inlets are just visible.

During the several years that Stratton furnaces have been in operation considerable data have been collected to establish performance records. Two typical sets of observations and calculations have been arranged in parallel columns in Table 2. The first represents the results at the Continental-Diamond Fibre Company, using a Pennsylvania coal with relatively low fusing temperature of the ash, while the second was made at the U. S. Gypsum Company burning another Pennsylvania coal but this time with high

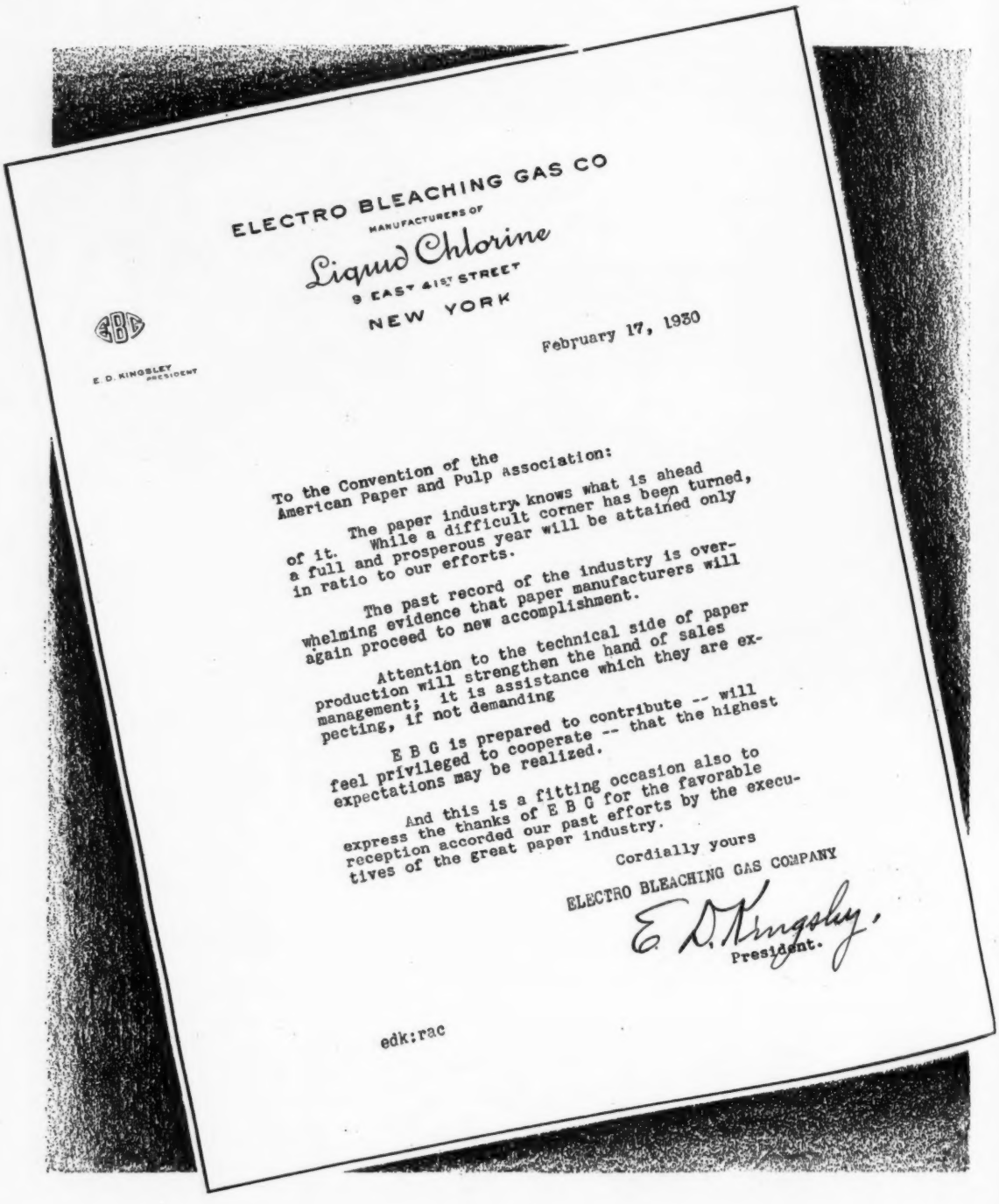

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TABLE 2

Boiler	Heine	Erie City
Rated capacity	435 h.p.	508 h.p.
Fuel	Pennsylvania coal	Pennsylvania coal
Analysis: Moisture	4.95 per cent	3.85 per cent
Ash	9.07 per cent	8.15 per cent
Volatile	32.70 per cent	33.10 per cent
Sulphur	1.18 per cent	1.18 per cent
B.t.u.	13,080	13,540
F.T.A.	2,350 deg.	2,600 deg.
Steam pressure	158 pounds	320 pounds
Flue gas temperature	530 deg.	555 deg.
CO_2 percentage	14.1	13.4
Combustible in refuse	17.00 per cent	8.10 per cent
Furnace volume	1,850 cu. ft.	1,800 cu. ft.
Fuel per hour	2,710 pounds	2,485 pounds
Fuel per cu. ft. per hour	1.46 pounds	1.38 pounds
Heat release	19,100 B.t.u.	18,700 B.t.u.
Steam per hour	25,830 pounds	24,850 pounds
Evap. per pound coal	9.55 pounds	10.00 pounds
Per cent rating	197	160
Heat balance:		
Heat absorbed	80.8 per cent	79.3 per cent
Stack loss	10.8 per cent	11.8 per cent
Refuse loss	2.0 per cent	.8 per cent
Unpreventable losses	6.4 per cent	8.1 per cent
Cost of fuel per ton	$3.84	$3.72
Cost per 1,000 pounds steam	$ .201	$ .186

Stratton Engineering Corp.

ash fusing temperature. The heat balances show 80.8 per cent and 79.3 per cent for combined efficiency. The boilers are not equipped with economizers, air-preheaters, or water walls. In

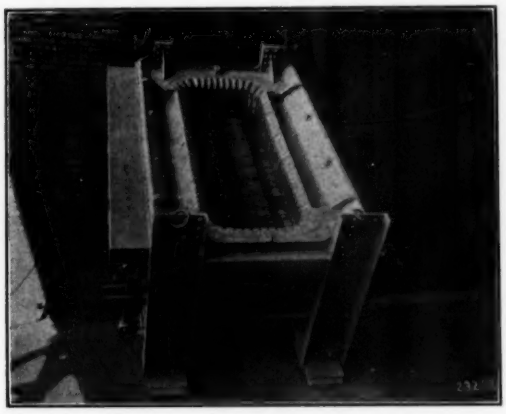


FIG. 5
Stratton throat unit showing hollow castings, grates and slot.

each case actual operating conditions were maintained with no effort to establish "test" results by close supervision. The fireman was in full charge of the operation of the boilers and furnaces.

Both sets of figures bring out, in a striking manner, the fact that with a reasonably high percentage of CO_2 in the flue gases, combined with low exit temperatures from the boiler, together with a low refuse loss, high efficiency automatically follows. The Heine boilers at the Continental-Diamond Fibre Company are two-pass units, baffled vertically, and even at an average rating of 197 per cent the exit temperature was but 530 degrees.

Another tabulation will show what has been accomplished with the Stratton furnace when burning low grade coal. Table 3 presents the results obtained with Western Kentucky and also with Tennessee coals. These coals are high in ash content, high in sulphur, and low in heat value, with a low fusing temperature of

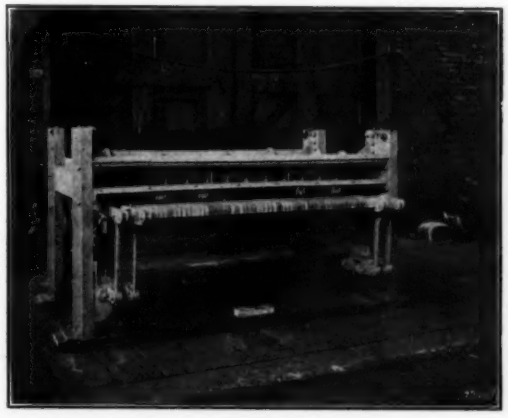


FIG. 6
Stratton throat unit, side view.

the ash. With the boilers operated over 200 per cent of rated capacity, the efficiencies were between 76 per cent and 77 per cent. Here again the results were obtained on boilers not equipped with economizers, water walls, or air-preheaters.

Fuel Selection

It is quite interesting to see what it means to be able to use coals of low ash fusing temperatures. Take for example our coals of Pennsylvania, Maryland, and Northern West Virginia. Fig. 10 presents the relation between bituminous coal production in these states and the fusing temperature of the ash in these coals. From the graph it can be seen that all of the coals have ash fusing temperatures over 2000 degrees, while the high limit is reached at something over 2900 degrees. If the particular plant's limitation is 2600 degrees, there is but 15 per cent of the output of this area available, which means, of course, rather close selection of coal. If, on the other hand, the lower limit of ash fusing temperature is 2300 degrees, then there is available 77 per cent of the coal production in this area, and the problem of coal selection is considerably simplified.

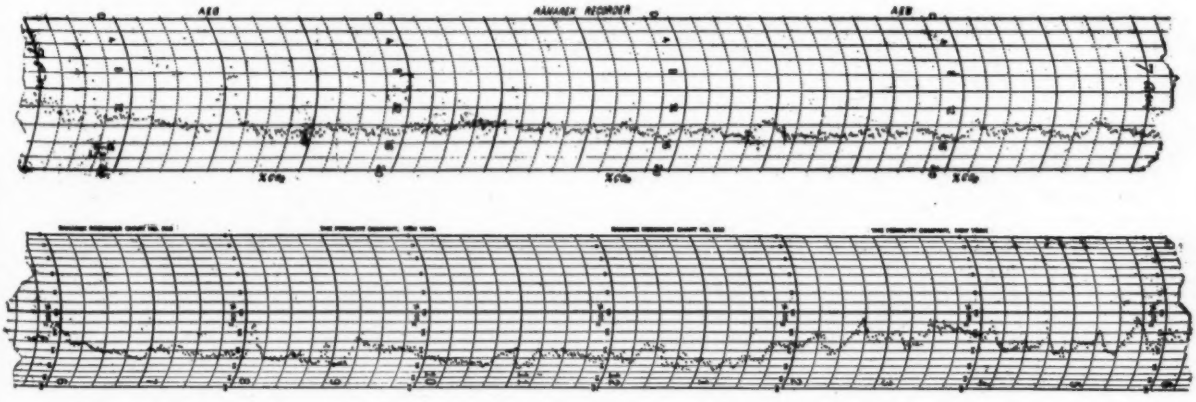
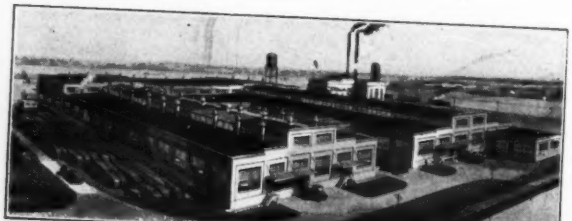


FIG. 7
Carbon dioxide charts from two different Stratton furnace installations.

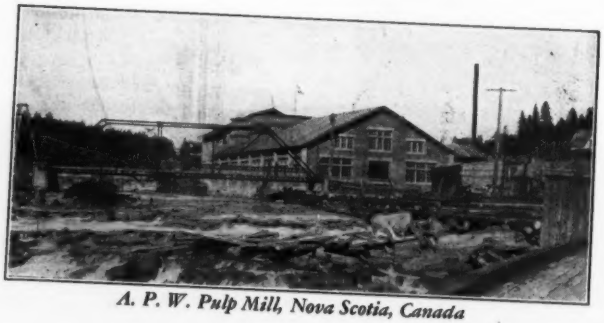
A. P. W.

PAPER COMPANY

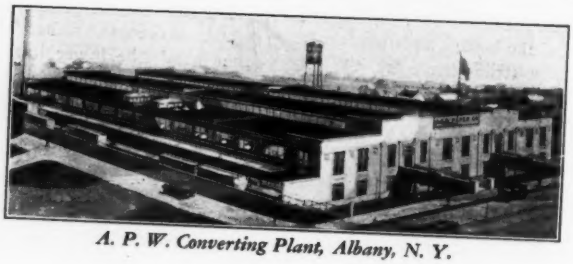
Albany, New York



A. P. W. Paper Mill, Albany, N. Y.



A. P. W. Pulp Mill, Nova Scotia, Canada



A. P. W. Converting Plant, Albany, N. Y.

Makers of TOILET PAPER, PAPER TOWELS, GROUND WOOD PULP

TABLE 3

Boiler	Erie City	Erie City
Rated capacity	508 h.p.	508 h.p.
Fuel	Western Ky. coal	Tennessee coal
Analysis: Moisture	8.79 per cent	4.36 per cent
Ash	11.00 per cent	11.05 per cent
Volatile	31.30 per cent	30.90 per cent
Sulphur	3.41 per cent	2.56 per cent
B.t.u.	11,380	12,520
F.T.A.	2,155 deg.	2,320 deg.
Steam pressure	333 pounds	340 pounds
Flue gas temperature	544 deg.	580 deg.
CO_2 percentage	11.7	13.0
Combustible in refuse	8.92 per cent	9.90 per cent
Furnace volume	1,900 cu. ft.	1,900 cu. ft.
Fuel per hour	3,990 pounds	4,408 pounds
Fuel per cu. ft. per hour	2.10 pounds	2.32 pounds
Heat release	23,900 B.t.u.	29,100 B.t.u.
Steam per hour	32,300 pounds	39,400 pounds
Evap. per pound coal	8.09 pounds	8.95 pounds
Per cent rating	204	242
Heat balance:		
Heat absorbed	76.6 per cent	76.7 per cent
Stack loss	14.0 per cent	13.3 per cent
Refuse loss	1.3 per cent	1.4 per cent
Unpreventable losses	8.1 per cent	8.6 per cent

Stratton Engineering Corp.

The degree of freedom which the buyer has to choose the cheapest coal is directly dependent upon the type of coal burning equipment and the service it is expected to perform. This is particularly true in the states east of Illinois and north of the Mason and Dixon Line.

In this area this factor alone will affect the ultimate cost of steam from 10 per cent to 25 per cent, depending upon the individual circumstances, and this wide spread in values exists wholly within the range of regularly merchantable coals.

Take for example, a point in the Middle Atlantic States where the Clearfield freight rate is $2.76 a net ton, and a plant at this point which requires a low volatile coal, with a minimum ash fusing temperature of 2500 degrees. This is not a very severe limitation on coal buying. A coal meeting these requirements and having an average ash of 8 per cent and heat value of 14,450 B.t.u. dry, could have been bought under the stable market conditions existing in the Spring of 1929 as low as $1.80 at the mines. Probably $2.00 would be a more

FIG. 8
Stratton furnaces at plant of Continental-Diamond Fibre Co., Bridgeport, Pa.

representative price, but using the lower figure, this coal would yield at destination 63,400 B.t.u. for one cent.

At the same time, a high volatile slack coal, such as the Stratton Furnace can use, averaging 10 per cent ash and 13,600 B.t.u. dry, could have been bought for $1.00 a ton at the mine. It would take a freight rate to the same destination of $2.98 a net ton. This coal could yield, if equipment were available to efficiently burn it, 68,300 B.t.u. for one cent. This represents a minimum difference in value, at destination, which after allowing for the lower quality and higher freight rate, is equivalent to 31 cents a ton, in favor of the high volatile coal.

This is a minimum difference. Many buyers in this territory are paying over $2.00 due to more severe restrictions imposed by their plant requirements, so that there is, in many cases, a handicap equivalent to as much as $1.00 a ton, over what might be done with Stratton furnace equipped boilers.

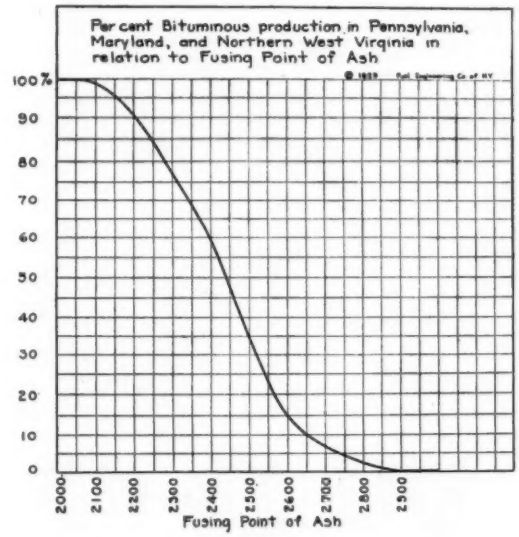


FIG. 10

High volatile coal is not necessary for the Stratton furnace, but the high volatile coals are the cheapest in most sections, and the most plentiful.

Then there are those plants which require a sized coal. At one extreme are those plants which find it necessary to use a screened lump coal, and at the other those which require

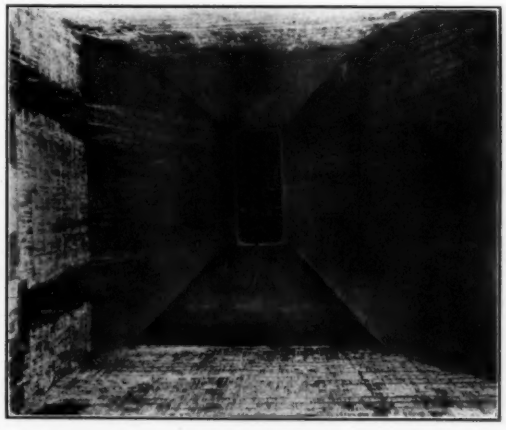


FIG. 9
Looking into furnace throat at Continental-Diamond Fibre Co.

pulverized coal. In either event there is a surcharge for sizing of at least 25 cents a ton, which has nothing to do with the heat value of the coal, but is a requirement imposed by the plant to adopt the coal to the method used to recover the heat. It should be remembered that a surcharge of this kind of as little as 25 cents a ton is a direct offset to efficiency, equivalent to at least 5 per cent, and often as much as 10 per cent, depending upon the cost of coal.

Burning Wood Refuse

There is another field of combustion into which the Stratton furnace fits in an interesting manner. It is the burning of

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wood-refuse. A few months ago, at the request of several concerns interested in this matter, a Stratton furnace was equipped to burn hogged wood fuel. It performed perfectly developing a combined efficiency of 72.5 per cent. The furnace used was one in which coal was burned regularly, so that no effort was made to especially design the unit for wood-refuse. The boiler developed 125 per cent of rated capacity, the heat release being 29,000 B.t.u. per cubic foot of furnace volume. During the entire run there was no smoke issuing from the stack. Later a combination of coal and wood-refuse was burned with equal success.

The demonstration was enthusiastically viewed by the observers, and proved the success of this method of combustion in the field of wood-refuse. It makes possible the use of either wood-refuse or coal, or a combination of each, using the same equipment. One boiler will serve for both fuels, whereas at the present time, many plants find it necessary to use one boiler for wood-refuse, and to carry in a banked condition a coal burning unit in readiness to take over the load when the supply of wood-refuse fails.

Operating Costs

The important items of operating cost in steam generation are labor, repairs and maintenance, and power. With the Stratton furnace, the labor required is as low as with any other type of equipment, and less than that required in many existing plants.

One user of Stratton furnaces found that for the first ten months of 1929 all labor, maintenance, repairs, and power, including coal preparation, amounted to 2.86 cents per 1000 lbs. steam generated.

At the plant of the U S. Gypsum Company the total repair and maintenance cost on one furnace for two years was $110.00. This figure includes both furnace parts and brick work, and covers a period in which something over 20,000 tons of coal were consumed in this unit.

The entire Stratton furnace equipment, including the grate movement, and the coal feeder, exclusive of the fan, is operated by a ¾ horsepower motor, which is contained in the drive stand control. The power required for the fan, which delivers air at 4 inch pressure in the main supply duct, is no more, and in most cases less than that required for other combustion equipment. Crushing coal to ¼ inch requires about 3 kwh per ton of coal.

In a report made for one of their clients and dated May 1928, the Sherman Corporation, engineers, established the following tabulation (Table 4) in which comparison is made between the various coal burning methods.

TABLE 4

	Pulverized Coal Central	Pulverized Coal Unit	Stoker	Stratton
Type of fuel	Any	Any	Low ash	Any
Drying	Yes	Yes	No	No
Pulverizing	Yes	Yes	Crushed	Crushed ¼" max.
Flexibility	High	High	Low	High
Banking	No	No	Yes	Yes
Operating power per ton.	41.7 kw. h.	29.0 kw. h.	14.8 kw. h.	9.4 kw. h.
Operating labor per ton..	$.206	$.115	$.167	$.115
Maintenance per ton...	$.20 to .30	$.20 to .30	$.20	$.01
Air pressure	16" to 20"	16" to 20"	8" to 10"	4"
Smoke	No	No	Yes	No
Ash nuisance	Great	Great	Considerable	Very little

The Sherman Corporation, New York.

The purpose of this paper has been to outline that method of burning crushed coal in suspension, using the Stratton vertical jet furnace. Over the period of more than five years considerable data have been gathered to prove its successful performance as judged from its high combustion efficiency and low operating costs. To these advantages can be added smokeless operation and no fly ash. Its low cost of coal preparation is something that strongly appeals to all those concerned with boiler plant design.

One of the most recent installations of Stratton furnaces is in the paper industry, in the mill of the Gardner & Harvey Company at Middletown, Ohio.

Those interested in the Stratton furnace are particularly gratified with the part the paper industry has played in accepting and demonstrating the principles involved in this method of combustion.

The Deterioration of Paper, A Review*

W. F. Hoffman and S. R. Olser[1]

We have been asked by the chairman of the committee on Fine and Special Papers to prepare a paper on the effect of acidity on paper, and more particularly the effect of acidity on the permanency of paper. As this is essentially a review of the literature, reference is made to most of the principal or typical papers which have been published on this subject. We do not contend that this paper contains a complete bibliography. It has not been possible in all cases to review the original article and in these cases the reference to the abstract is given in addition to the original reference.

It has only been during the last five or six years that special attention has been given to the acidity of the paper machine furnish as well as to studies to determine the effect of acid on the physical properties of the paper. Considerable work had been done on the alum furnish and on the physical properties of paper which were undoubtedly influenced by the acid in the paper.

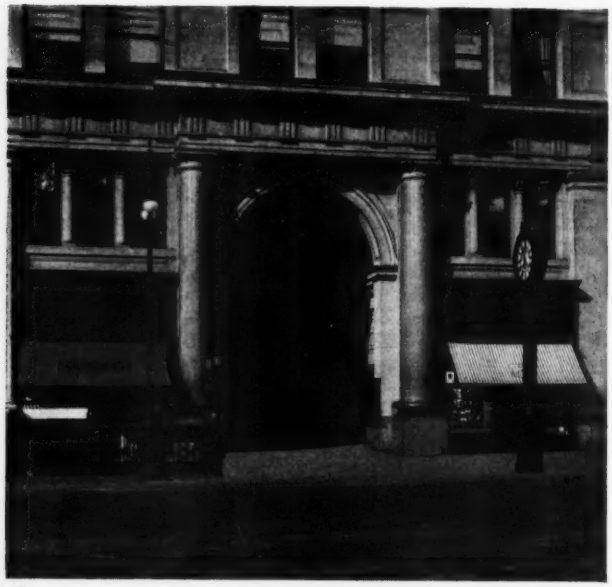
It is not the purpose of this paper to go into a description of the methods for measuring the active acidity or the total acidity. Neither will we give a definition or explanation of the various terms used.

Several papers have been published which describe the various terms used as well as the theories involved in this work. There are two methods of determining the active acidity or pH of a solution. These are the electrometric method and the colorimetric method. Taylor,[2] in numerous articles has described the colorimetric method in great detail. He also explains the theories involved in the determination of active acidity or pH.

Several articles have been published which describe the methods used in determining active acidity or pH values by the electrometric method. The theories involved in this determination was explained and illustrated. Buck[3] has published an article on hydrogen ion concentration and its measurement, explaning the terms, hydrogen ion concentration and pH and describing methods of measuring hydrogen ion concentration, both electrometric and colorimetric.

At the Technical Association meeting two years ago one of the authors[4] presented a paper on "Hydrogen ion measurements in the pulp and paper mill." The paper deals with the description and theories of making hydrogen ion measurements electrometrically, calling attention to the simplicity of this method. We quote from the above article "Non-technical men in general, and even many who are technically trained, regard this method of measuring hydrogen ion concentration as being exceedingly difficult and too complicated for a technical laboratory. The reasons for this are

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 19, 1930.
[1] The Northwest Paper Company, Cloquet, Minn.
[2] Taylor, W. A. Ind. & Eng. Chem. 19, 999-1004 (1927); Tech. Assoc. Papers, Ser. IX, No. 1:38-43 (1926).
[3] Buck, K. Pappers—Ach Travarutidskeift for Finland 22:648 (1926).
[4] Hoffman, W. F. Tech. Assoc. Papers, Series XI, No. 1, 24-27 (1928).



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probably the difficulties experienced by the pioneer workers in the field and the fact that many laboratories, both commercial and university do not have modern apparatus for electrometrically determining hydrogen ion concentrations. With modern equipment which may be purchased from chemical supply firms, a non-technical man can be trained to make accurate routine electrometric hydrogen ion concentration measurements in a very short time but should always be under the supervision of a trained chemist." At the present time we are using both the colorimetric and electrometric method of measuring hydrogen ion concentrations. The method used depends upon the color, type and other properties of the solution.

Schulze[5] has also published a similar article in which special attention is paid to the theory of pH measurement and to the method of pH determination by electrometric methods. He also states that this method is being used in further work on the actual acidity of a large number of papers. Attention has been called by Franke and Willaman[6] to the probable usefulness of pH measurements in controlling the addition of size and alum to the beater. A study was also made of the various electrodes which have been developed and are suitable for pulp and paper mill work.

Several books have been written describing both the colorimetric and electrometric method of measuring hydrogen ion concentration. For a detailed description of these procedures the reader is referred to such books as those written by Clark[7], by Kolthoff and Furman[8] and by Michaelis[9].

A large number of papers have been written dealing with the hydrogen ion concentration of paper furnishes but with the view point only as it effects the sizing, color and similar qualities of the sheet. The hydrogen ion concentration of the furnish is one of the important factors in the rate of deterioration of paper. One of the authors[10] has called attention to the fact that there are several factors in the manufacture of paper in which the alum content and the acidity of the furnish play an important part. These are outside the scope of this article. The reader is referred to the section under "Hydrogen ion concentration" in the Bibliography of PaperMaking[11] for references to articles on these subjects.

Effect of Acid

Only a few papers have been published which give results of work done on the relation of the acid in paper to the permanency of the paper. We wish again to make the statement that we believe that the acidity of the paper is only one of the factors which determine the permanency of paper, and also, that its effect on the permanency is only one of the factors in the manufacture in which is plays a part. Only the part acidity plays in the deterioration of paper on ageing will be discussed.

Hall[12], in an address delivered before the Paper Testing Sectional Meeting in 1925 described the work done by the Swedish Government Testing Institute in Stockholm. This work consisted of a study of the acid number of paper and its effect on the permanence. The method of determining the acid number, which is the total number of cubic centimeters of 0.01 N sodium hydroxide required to neutralize to phenolphthalein the acid extracted from 10 grams of paper, is described in detail by Taylor and Hall[13]. From the results of a series of studies on papers of different types and from different manufactures, he points out that rosin sizing increases the acidity which causes a deterioration of the paper greater than that of unsizing paper, but that the deterioration caused by rosin size is not great. He notes that rosin sizing can be used for paper requiring a high permanency, provided that the sizing be carried out without the use of an excess of aluminum sulphate. In recommending the condition for manufacturing a paper which will not deteriorate, he states, "If rosin sizing is applied, the amount of rosin should be kept down to a minimum and not more aluminum sulphate than about 0.8 per cent to each per cent of rosin to be used."

Acidity and Permanence

Holwech[14] in a paper on "Qualities of paper in the Government" states that the acidity is very important in the manufacture of permanent paper. He describes the method used by this laboratory for determining the acidity and gives some of the results of his work. At the Technical Association meeting two years ago, a report[15] was given of work done in our laboratory on the effect of residual acid on the rate of deterioration of paper. A method was described for measuring the hydrogen ion concentration or pH of paper. From the results of these tests the following conclusions were drawn. "It was found that the higher the acid number, and the higher the hydrogen ion concentration, the greater in general, was the decrease of bursting strength of the paper. If the acid number of the paper is below about 25, as measured by the Swedish Government Testing Laboratory's method, the paper does not decrease appreciably in bursting strength when heated at 85 deg. C. for periods as long as 72 hours. If the hydrogen ion concentration is less than that represented by about pH 4.5 as determined in these tests, there is no appreciable loss in bursting strength of the paper except when they are heated at 85 deg. C for more than 24 hours. When heated for a longer period the hydrogen ion concentration should be less than that represented by about pH 4.7 to prevent deterioration due to acid."

The importance of a thorough study of permanency of paper has been again emphasized by Bentzen[16].

pH of Furnish

The interest of the various mills men in such problems and especially as the permanency is effected by the pH or hydrogen ion concentration of the furnish or the finished paper is shown by the remarks made in the discussion on control of beater furnish for book paper[17]. In a general discussion[18] of the deterioration of paper by excessive acidity one of us has pointed out the usual cause of acidity in paper and the proper use of alum in the beater room. There are many factors in the manufacture of paper in which the acidity of pH plays a part. A universal acidity or pH cannot be recommended. The various conditions at the particular mill must be taken into consideration as well as the type of paper. For example, if a paper is to be made in which the durability is of prime importance, then the alum added or the final acidity should by all means be reduced to a minimum. In another case the important characteristic may not be durability but color or some physical characteristic which may be aided by excessive acidity.

Summary

We have reviewed the literature on the methods of measuring the active acidity or pH in paper mills. The results of these measurements applied to the machine room and the finished paper indicate that if a "permanent" paper is to be manufactured, the active acidity of the paper as measured imperically must not be greater than that represented by about pH 4.8 or 5.0. These are other factors influenced by this active acidity of the paper furnish and a universal pH of paper furnishes cannot be recommended. This should be worked out for each mill and for the particular type of paper manufactured.

[5] Schulze, Dr. Bruno. Wochenblatt fur papier fabrikation, Vol. 59, No. 39, Sept. 29, 1928.
[6] Franke, K. W., and Willaman, J. J. Ind. & Eng. Chem. 20: 87-95 (1928).
[7] Clark, T. Mansfield. "Determination of Hydrogen Ions," 3rd edition, Williams and W. Wilkins Co., Baltimore, Md. (1928).
[8] Kolthoff, I. N., and Furman, N. H. Potentiometric Titrations, John Wiley & Sons, Inc., New York City (1926).
[9] Michaelis, L. Hydrogen Ion Concentration. Williams & Wilkins Co., Baltimore, Md. (1926).
[10] Hoffman, W. F. Tech. Assoc. Papers, XII, No. 1, 81-82 (1929).
[11] West, C. J. Bibliography of Paper Making—1900-1928. Lockwood Trade Journal Co., Inc., New York, N. Y.
[12] Hall, G. Tech. Assoc. Papers 9:92-98 (1925).
[13] Taylor and Hall. Paper Industry 7:1059-1063 (1925).
[14] Holwech, W. Paper Journalen 14:273 (1926), and 15 (1927); Papier fabrikant 42, p. 659 (1927).
[15] Hoffman, W. F. Tech. Assoc. Papers XI, No. 1, p. 62-64, 1928.
[16] Bentzen, T. C. Tech. Assoc. Papers XI, No. 1, 119-120 (1928).
[17] Tech. Assoc. Papers IX, No. 2, p. 25-30 (1926).
[18] Hoffman, W. F. Tech. Assoc. Papers XII, No. 1, p. 81-82 (1929).

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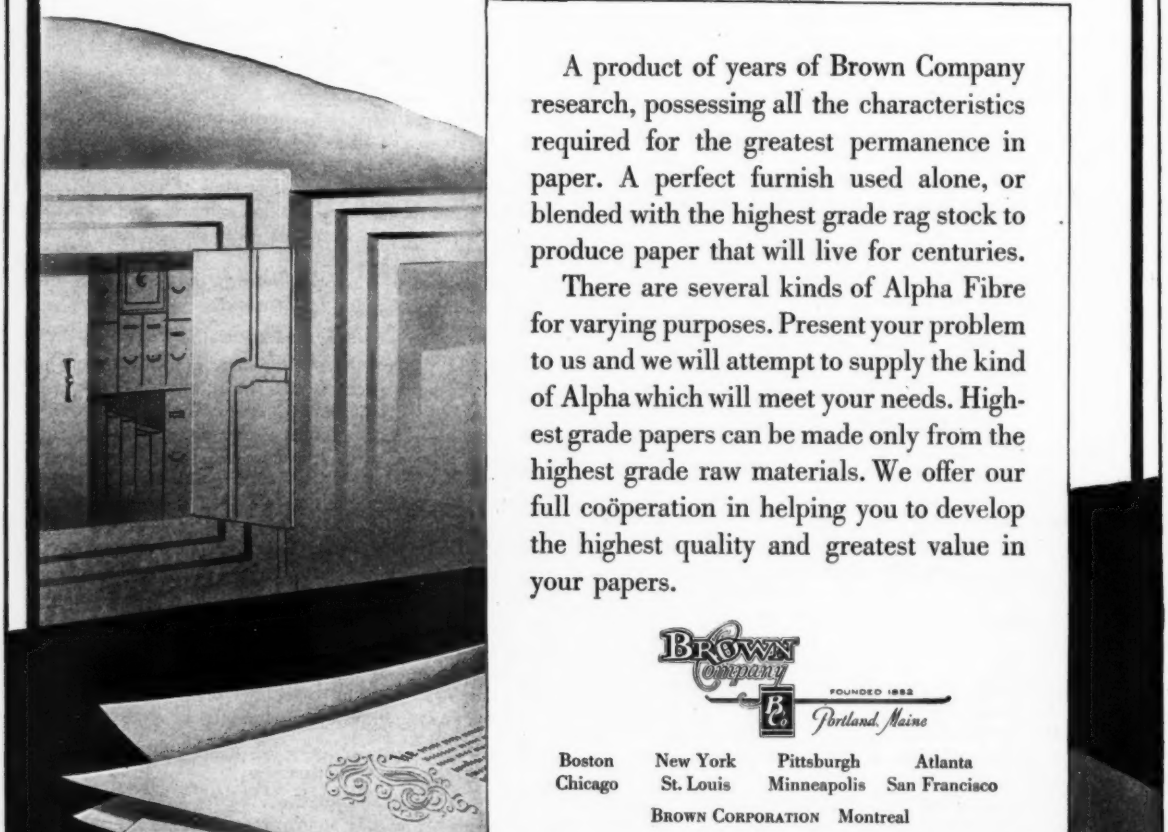

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Effects of Bleaching Variables on The Strength Properties of Easy-Bleaching Spruce Sulphite Pulp*

By P. K. Baird[1a] and R. H. Doughty[1b]

Synopsis

In a study of the effect of bleaching variables on the strength properties of the bleached pulps, as developed by the standard testing methods it has been shown that:

1. Preparation of the pulp for bleaching by preliminary shredding did not seriously affect the strength properties of either the bleached or unbleached pulps.

2. Increasing the rate of agitation from 1 to 8 r.p.m. of the bleaching apparatus, resulted in an increase in the bursting and folding strengths and no change in the tensile and tearing strengths. The rate of strength development under physical processing was increased by increased agitation.

3. Increasing the consistence from 2 per cent to 7 per cent resulted in an increase in the bursting strength; a decrease in the tearing strength; and no effect on the tensile and folding strengths. The rate of strength development under physical processing was increased slightly.

4. Increasing the temperature from 21 to 41 deg. C. resulted in a slight decrease in the folding and tearing strengths, had no effect on the bursting, and slightly increased the tensile strength. The strength development rate was greater for higher temperatures.

5. Increasing the bleach ratio from 12.3 per cent to 17.0 per cent on an easy-bleaching sulphite pulp resulted in a slight decrease in all the strength properties except bursting, which was not changed. The rate of strength development as determined by the Forest Products Laboratory pebble mill method No. 101[2] was increased with higher bleach ratios.

6. These effects may be ascribed to a combination of chemical and mechanical actions during the bleaching, which influence the fibrillation and hydration of the fibers on beating, and affect both the papermaking qualities and ultimate fiber strength of the pulp. It is probable that the alkalinity of the bleach solution also has an effect. This has not yet been investigated. Lack of agreement with the results of some other workers may be explained on the basis of differences in physical processing and strength testing procedures and control of the variables of the bleaching process.

Introduction

The work described in this report was to determine the effect during bleaching, upon the strength properties of the bleached pulp of bleach ratio, consistence, temperature, and agitation of the pulp as determined by the standard physical testing apparatus and methods. The immediate objective was to furnish a basis for a more detailed study of this effect with other pulps, apparatuses, and experimental conditions of bleaching. Tests to determine the effect of shredding on the strength of the unbleached pulp were also necessary inasmuch as the pulp was bleached in a shredded condition.

A number of experiments in which the effect of conditions other than bleach ratio could be studied were carried out. It was expected that any effects of variables other than bleach ratio on strength properties would be small, since this had been the case in studying color and chemical properties. Moreover the spruce sulphite which had been used for all previous studies seemed to fall in the class of easy-bleaching pulps improperly cooked for strength development. *(16)*[3]. With such a pulp, any bleaching whatever might have an adverse effect on the strength properties, with a tendency for the specific effects of different conditions to be less marked than in a high grade bleachable pulp.

Review of Literature

The variables studied were those that could be controlled experimentally, all of which have already been studied *(1, 2, 3, 4, 5, 6, 7)* as regards their effect upon other phases of bleaching. Studies of the effects of the bleaching variables on the strength of the bleached pulp as reported in the literature are mainly confined to bleach ratio, that is, the effect of normal bleaching and over-bleaching. The results obtained by different workers vary greatly, which may be due, in part, to differences in procedures. For example Froberg *(9)* noted a decrease in folding strength and a slight decrease in breaking length on normal bleaching; a slight over-bleaching caused a large decrease in strength. Sutermeister *(13, 14)* on the contrary found that the strength decreased in the first part of bleaching and then later increased above the initial value, even with considerable over-bleaching; the strength of over-bleached pulp was, however, less than that of pulp correctly bleached. His method consisted of treating portions of pulp with bleach ratios varying from 1 to 24 per cent and then determining the strength of the bleached pulp after processing for 60 minutes in a pebble mill and making the usual physical tests.

Schwalbe *(12)* reports some experiments in which the tensile strength was determined on samples removed at intervals during bleaching in a commercial beater. With sodium hypochlorite as a bleaching agent, there was a loss in strength throughout the bleaching reaction, while with bleaching powder (calcium hypochlorite) the strength at first increased somewhat and then fell below the initial value as the bleaching reaction progressed.

Similar results are reported by von Ehrenthal *(8)* who observed that "no general rule can be stated governing the effect of bleaching on strength," but concluded that a comparatively strong easy-bleaching pulp can be made.

Swanson and Monsson *(16)* likewise conclude from a series of studies on the cooking of spruce for easy-bleaching sulphite that *correctly cooked pulps* do not suffer a loss in strength when properly bleached and that over-bleaching is detrimental to strength, especially with improperly cooked pulps.

Porrvik *(11)* states that properly bleached pulp will develop a higher strength on beating than the unbleached, due apparently to chemical loosening of the fibrillae, but that over-bleaching results in the formation during beating of dextrin-like substances, which have no properties to bind the fibers together.

Porrvik also reports the effect of bleaching at a consistence of 42 per cent in a special hollander. He found this consistence to be much too high; the pulp so bleached hydrated rapidly upon beating without developing the proper strength.

The foregoing conclusions apply in general to spruce sul-

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* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 20, 1930.

[1a] Member TAPPI; senior chemist, Forest Products Laboratory, Madison, Wis.

[1b] Member TAPPI; assistant engineer, Forest Products Laboratory, Madison, Wis.

[2] Manual of testing methods for pulpwood, pulp, stuff and paper, 1928, U. S. Forest Products Laboratory. (Mimeograph.)

[3] Reference is made by italic number in parentheses to "Literature Cited" at the end of this report.

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Table 2—The Effect of Shredding an Unbleached Sulphite P ulp on Its Strength Development

Sample No.	Methods of preparation and testing	Length of time in pebble mill—minutes: Bursting strength—Points/pound/ream 20	40	60	80	100	120	Tensile strength—Meters breaking length 20	40	60	80	100	120	Folding strength—Double folds 20	40	60	80	100	120	Tearing strength—Grams/pound/ream 20	40	60	80	100	120
I-A	By hand—Method No. 98	0.16	0.32	0.46	0.57	0.69	0.67	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...
I-B		0.19	0.26	0.44	0.56	0.67	0.67	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...
Av.		0.18	0.29	0.45	0.57	0.68	0.67	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...
II-A	Shredded—Method No. 98	0.21	0.42	0.54	0.67	0.70	0.68	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...
II-B		0.21	0.35	0.60	0.60	0.63	0.66	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...
Av.		0.21	0.39	0.57	0.64	0.67	0.67	....	....	....	....	....	....	...	...	...	...	...	...	...	...	...	...	...	...
III-A	By hand—Method No. 101	0.13	0.36	0.55	0.72	0.75	0.74	904	1924	2826	3300	3712	3594	...	7.5	26.5	39.5	72	152	0.94	1.45	1.67	1.54	1.72	1.87
III-B		...	...	...	0.72	0.77	0.66	....	....	....	3155	3757	3889	...	...	...	99.0	111	55	...	...	...	1.54	1.44	1.39
Av.		...	...	...	0.72	0.76	0.70	....	....	....	3228	3735	3747	...	...	...	69.0	92	104	...	...	...	1.54	1.58	1.63
IV-A	Shredded—Method No. 101	0.11	0.41	0.61	0.73	0.72	...	1108	2231	2759	3323	3500	....	...	6.7	18.0	44.0	59	...	0.92	1.55	1.73	1.59	1.58	...
IV-B		...	...	0.63	0.69	0.72	...	....	....	2710	3205	3560	....	...	...	36.0	37.0	125	...	...	...	1.64	1.70	1.46	...
Av.		...	...	0.62	0.71	0.72	...	....	....	2735	3264	3530	....	...	...	27.0	41.0	92	...	...	...	1.69	1.65	1.42	...

phite pulps only. Sutermeister *(15)* found that soda pulp was weakened considerably by bleaching; hemlock sulphite also was weakened considerably, due no doubt to the high bleach ratios required to reach the desired high whiteness comparable to bleached spruce pulp.

Experimental

Apparatus

The equipment for experimental bleaching on a semi-commercial scale, and the processing and testing methods that have been adopted as standard, at the Forest Products Laboratory, have been described by Curran and Baird *(3)*. They were used in these experiments without change.

Table 1—Composition of Bleach Liquors

TABLE 1

Lot No.	Analysis No.	Date	Chlorine: Total	Available	Chloride	Chlorate	Alkalinity gm. $Ca(OH)_2$ per liter	Relative alkalinity
			Grams per liter					
5	1	Oct. 1, 1926	62.26	44.28	18.48	1.84	1.47	0.033
5	2	Dec. 14, 1927	58.73	29.82	28.91	4.37	0.73	0.024

Materials

The pulp employed was the same machine-dried, shredded, semi-easy-bleaching spruce sulphite that was used for the previous experiments. The bleaching liquor was prepared and preserved in the same way as for the previous experiments. It was saturated with $Ca(OH)_2$ to increase its stability. The increased alkalinity so obtained no doubt had a definite influence on the bleaching rate. The bleach liquor was preserved for 14 months, during which time the following analyses were made:

This bleach liquor had decomposed considerably at the end of the 14 months, forming chlorate to a greater extent than is usual for liquors so preserved. It is not considered probable, however, that the chlorate and chloride content of this bleach liquor had any important effect on the results of these studies.

Methods and procedure

The strength of the pulp was tested by the regular Forest Products Laboratory Method No. 101.[2] Results of some tests made on unbleached pulp by Method No. 98[2] are also included. Since the pulp used for these experiments was shredded before bleaching, it was necessary to determine whether or not the shredding had any detrimental effect on the strength.

The experimental conditions represented five combinations of the following variables: Bleach ratio, temperature, consistence, and agitation. These combinations were chosen to show the effect of changing independently each one over the widest practicable range. The choice was also influenced by the desire to obtain more information on the effect of temperature at high bleach ratios.

Experimental Data

In Table 2 are shown the strength values obtained by Methods Nos. 98 and 101 in the study of the effect of shredding as compared to disintegration of the pulp by hand. Both methods of testing were run in duplicate in every case.

The strength values for the bleached, milled pulps for various combinations of high and low temperatures, consistences, bleach ratios, and rates of agitation are shown in Table 3.

Interpretation of Results

Effect of shredding on strength

Tests by pebble mill method No. 98 indicated that there was no significant loss in strength of unbleached pulps due to shredding, as shown in Figure 1. Tests by method No. 101, comparing the shredded pulp and that torn up by hand (unshredded) were also carried out. The results of these tests are given in Fig. 1 and Table 2. In order to develop full strength properties it was necessary to mill the unbleached pulp 100 minutes. The strength of the shredded pulp increased somewhat more rapidly than that of the unshredded pulp. The strength properties of the shredded pulp were lowered slightly but the variation was in line with the precision of testing. From these tests it was concluded that the shredded pulp could be safely used to study the effect of the bleaching variables on strength.

The results of the strength development tests on the bleached pulps are given in Table 3. As in most other cases where the physical

Table 3—Effects of Bleaching Variables on the Strength Properties of Bleached Pulps

Experiment No.	Bleaching conditions: Temperature °C.	Consistence per cent	Bleach ratio per cent	Agitation rate r.p.m.	Length of time in pebble mill—minutes: Bursting strength Points/pound/ream 20	40	60	80	Tensile strength Meters breaking length 20	40	60	80	Folding strength Double folds 20	40	60	80	Tearing strength Grams/pound/ream 20	40	60	80
175	41	6.5	17	1.05	0.25	0.47	0.61	0.54	1325	2450	3324	3627	3.7	9.5	21	21	1.38	1.16	1.26	1.02
179	41	7.0	17	1.05	0.31	0.55	0.65	0.63	1934	3198	3762	3732	4.0	10.0	29	25	1.20	1.29	1.17	0.91
Ave.	..	...	...	...	0.28	0.51	0.63	0.59	1630	2824	3543	3679	3.8	9.7	25	23	1.29	1.23	1.21	0.96
176	41	7.0	17	8.00	0.31	0.58	0.70	0.64	1856	2596	3354	3791	3.5	11.0	27	34	1.37	1.21	1.23	1.20
180	41	7.0	17	8.00	0.35	0.60	0.67	0.61	2165	2913	3850	3202	6.7	16.0	22	26	1.26	1.13	1.01	0.99
Ave.	..	...	...	...	0.33	0.59	0.69	0.63	2011	2755	3602	3497	5.1	13.0	24	30	1.31	1.17	1.12	1.09
181	41	7.0	12.3	8.00	0.28	0.56	0.76	0.74	1781	2415	3485	3530	3.2	17.0	41	70	1.33	1.38	1.26	1.27
177	21	7.0	12.3	8.00	0.29	0.61	0.72	0.73	2002	3028	3273	3292	4.5	36.0	54	84	1.39	1.47	1.45	1.29
178	41	2.0	17	8.00	0.23	0.49	0.63	0.61	1298	2700	3400	3924	2.2	10.0	18	32	1.29	1.40	1.32	1.13
Shredded unbleached pulp					...	...	0.62	0.71	....	....	2735	3264	...	...	27	41	...	...	1.69	1.65

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or chemical effects of variable bleaching conditions have been studied using this spruce sulphite pulp, a trend was all that developed. The variations in strength produced were so small that it is unsafe to draw conclusions from them as to the behavior of pulps in general. In only two cases were check runs made, and in both (Runs 175 and 179; 176 and 180) the variation between the two check runs was nearly as great as that between the averages of the two sets of conditions.

EFFECT OF BLEACHING ON STRENGTH DEVELOPMENT RATE

In Fig. 2 the bursting strength values for the various pulps are plotted for ready comparison. Whereas the bleached pulps, except No. 177, developed maximum strengths in 60 minutes milling, the unbleached pulp required 100 minutes. This occurred in spite of the fact that the dry pulp was thoroughly soaked with water by mixing in the bleaching barrel for about two hours at high speed before pressing out and testing in the pebble mill. The bleaching agent probably loosens up the fibers, fibrils, or otherwise promotes a more rapid development of papermaking properties.

EFFECTS OF AGITATION

Upon the basis of the bursting test, the degree of agitation at both high temperature and high bleach ratio slightly influences the rate at which the pulp reaches maximum strength as well as the maximum strength value itself. Furthermore, the greater the amount of mechanical work expended on the pulp during bleaching the more rapid the strength development by milling, other conditions being the same.

It is not so clear, however, why the greater agitation in Runs Nos. 176 and 180 should also give a somewhat higher maximum folding and bursting strength than in Runs Nos. 175 and 179 as shown in Figs. 2 and 3. That the tearing and tensile strengths were not definitely affected by increased agitation is shown in Figs. 4 and 5.

EFFECT OF CONSISTENCE

Comparing the results of Runs Nos. 176 and 180 with Run No. 178 in Table 3 and Fig. 2, it is evident that increased consistence at

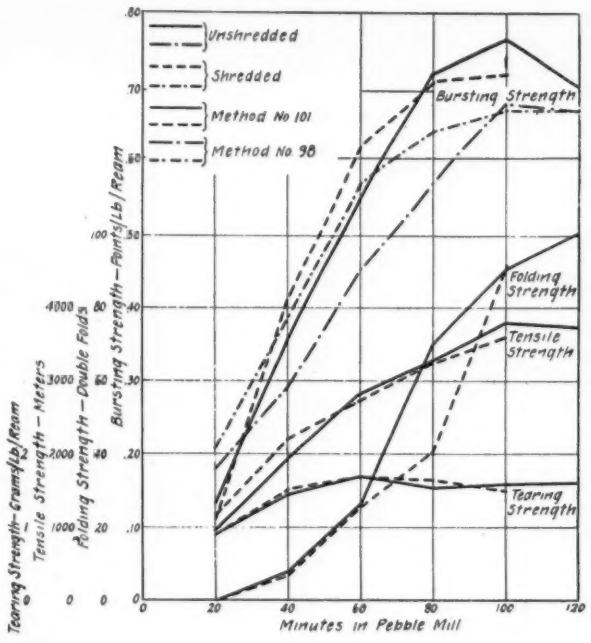

FIG. 1

The effect of shredding of unbleached sulphite pulp on its strength development.

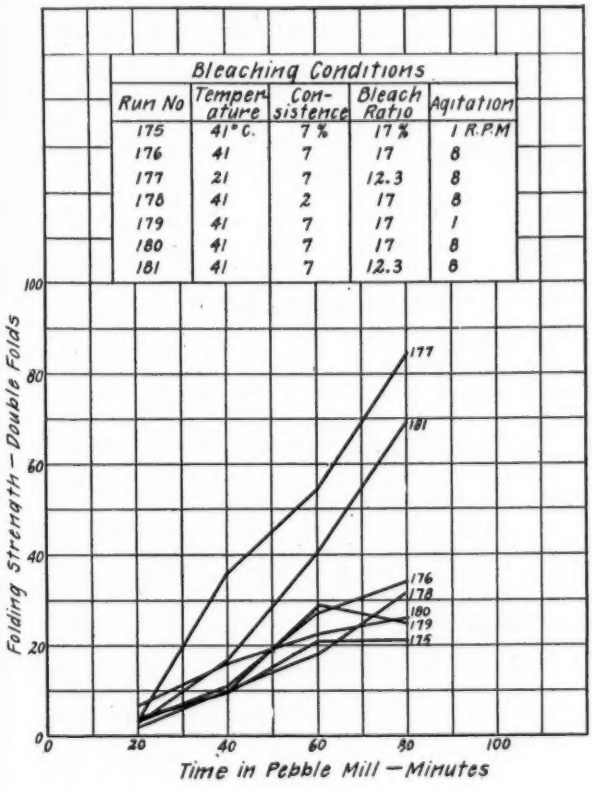
Bleaching Conditions
Run No | Temperature | Consistence | Bleach Ratio | Agitation
175 | 41°C. | 7% | 17% | 1 R.P.M
176 | 41 | 7 | 17 | 8
177 | 21 | 7 | 12.3 | 8
178 | 41 | 2 | 17 | 8
179 | 41 | 7 | 17 | 1
180 | 41 | 7 | 17 | 8
181 | 41 | 7 | 12.3 | 8
Folding Strength – Double Folds
Time in Pebble Mill – Minutes

FIG. 3

Folding strength values on variously bleached pulps.

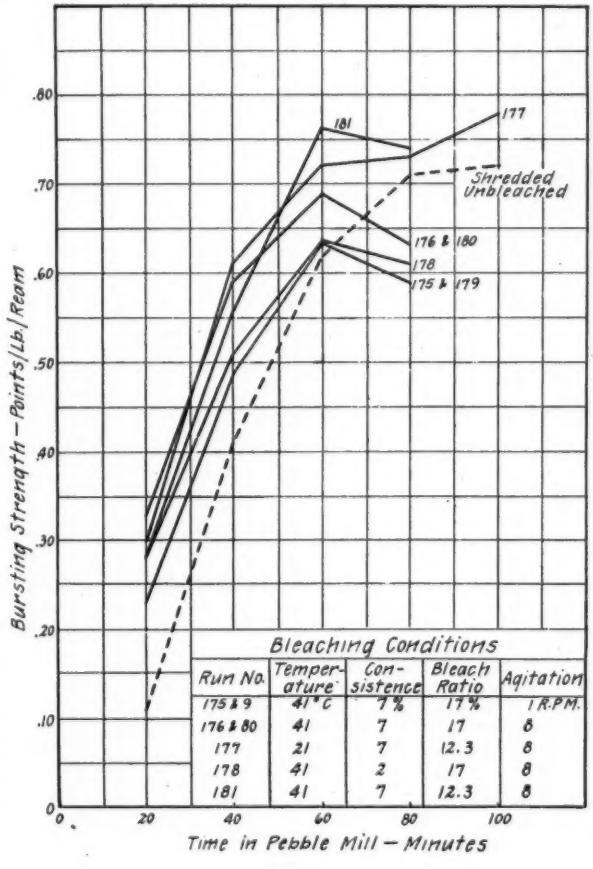
Shredded Unbleached
Bleaching Conditions
Run No. | Temperature | Consistence | Bleach Ratio | Agitation
175 & 179 | 41°C | 7% | 17% | 1 R.P.M.
176 & 180 | 41 | 7 | 17 | 8
177 | 21 | 7 | 12.3 | 8
178 | 41 | 2 | 17 | 8
181 | 41 | 7 | 12.3 | 8
Bursting Strength – Points/Lb/Ream
Time in Pebble Mill – Minutes

FIG. 2

Bursting strength values on variously bleached pulps.

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both high bleach ratio and temperature resulted in a higher maximum bursting strength. In Figs. 3 and 5, it may be seen that the folding and tensile strengths were not affected while in Fig. 4 the tearing strength was decreased.

EFFECTS OF TEMPERATURE

Comparing Runs Nos. 177 and 181 in Table 3, it appears that at a low bleach ratio, increased temperature (Run No. 181) resulted in decreased maximum strengths for fold (Fig. 3) and tear (Fig. 4), no changes in bursting, and an increase in tensile strength (Fig. 5). Apparently when bleaching at a low temperature, the character of the bleaching reaction is different than at high temperatures.

EFFECT OF BLEACH RATIO.

The results which are most definite are concerned with the effects of varying the bleach ratio, that is, of over-bleaching and under-bleaching. Just where over-bleaching commences with any pulp is difficult to determine. In the case of this particular pulp, 12.3 per cent bleach ratio was sufficient to produce an average white while 17 per cent gave a high white. Probably the use of 17 per cent resulted in some over-bleaching. In Table 3, it may be seen by comparisons that the maximum folding and tearing strengths of the pulps bleached at 17 per cent bleach ratio are lower, those of the bursting strength are about equal although developed earlier, and those of the tensile strength higher than the same maximum values for the shredded unbleached pulp. The strength properties developed by the pulps using 12.3 per cent bleach ratio are definitely higher than those developed by the unbleached pulp, except tear, which is lower. This is in line with Sutermeister's conclusions, that the color (degree of bleaching) accepted in practice as a satisfactory white is that color which experience has shown can be produced by a bleach ratio that will have the most favorable effect on the strength properties of the pulp.

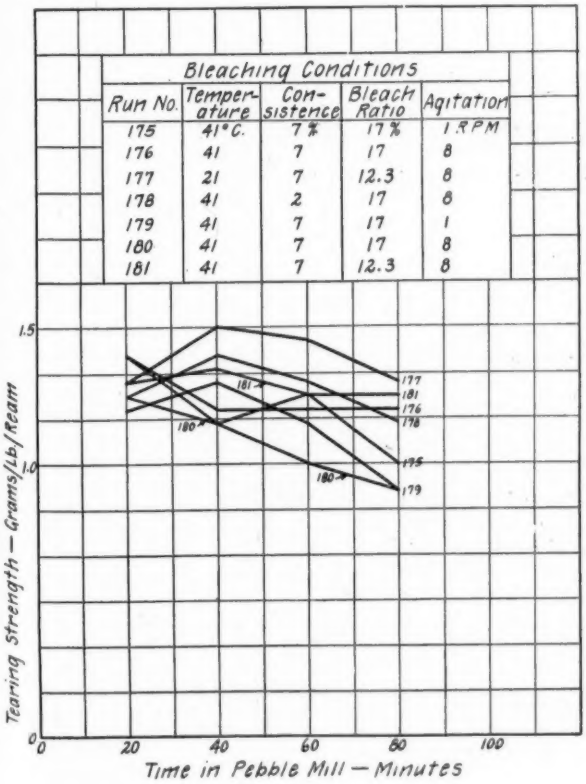
Bleaching Conditions
Run No. | Temperature | Consistence | Bleach Ratio | Agitation
175 | 41°C. | 7% | 17% | 1 RPM
176 | 41 | 7 | 17 | 8
177 | 21 | 7 | 12.3 | 8
178 | 41 | 2 | 17 | 8
179 | 41 | 7 | 17 | 1
180 | 41 | 7 | 17 | 8
181 | 41 | 7 | 12.3 | 8
Tearing Strength — Grams/Lb./Ream
Time in Pebble Mill — Minutes

FIG. 4

Tearing strength values on variously bleached pulps.

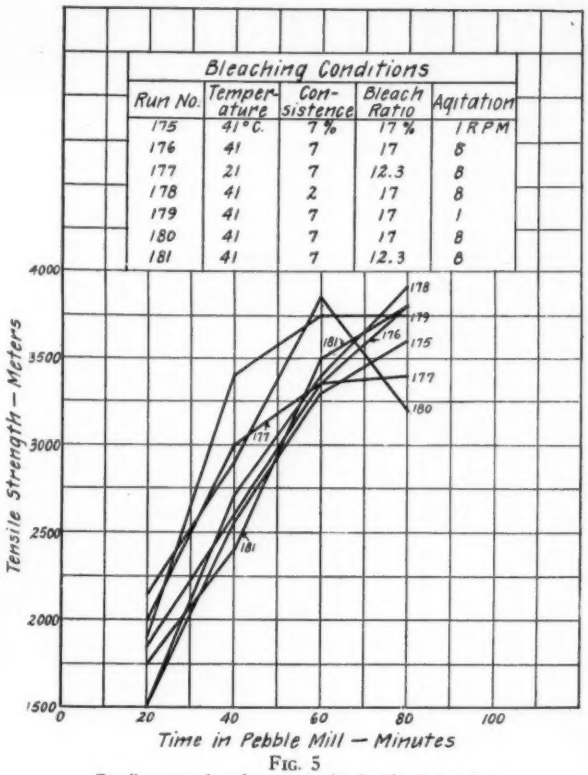
Bleaching Conditions
Run No. | Temperature | Consistence | Bleach Ratio | Agitation
175 | 41°C. | 7% | 17% | 1 RPM
176 | 41 | 7 | 17 | 8
177 | 21 | 7 | 12.3 | 8
178 | 41 | 2 | 17 | 8
179 | 41 | 7 | 17 | 1
180 | 41 | 7 | 17 | 8
181 | 41 | 7 | 12.3 | 8
Tensile Strength — Meters
Time in Pebble Mill — Minutes

FIG. 5

Tensile strength values on variously bleached pulps.

EVALUATION OF DATA

When considering the results of the strength development tests on these pulps, the limits of accuracy of the methods of strength testing must be kept in mind. The bursting strength values are the most trustworthy since they represent the average of 32 individual tests on several sheets. The other values are the average of four to six tests, the results of which may vary within rather wide limits; this is especially true of the folding test. Moreover, the bursting and tearing tests show a maximum value in the milling range used; the tensile strength remains about constant; and the folding strength value is still increasing at the end of 80 minutes. The maxima in these tests, therefore, are not necessarily the true maxima obtainable. Finally, small differences must be measured with considerable accuracy. For these reasons the conclusions should be primarily based upon the values for bursting strength. The other strength values are merely indicative of the complete effects of bleaching.

It has been pointed out that the results obtained by different workers studying the effects of the bleaching variables on the strength of the bleached pulp vary even to the point of contradiction. The explanation is probably to be found in the experimental procedure used, such as the lack of control of variables, and the method of carrying out the strength development tests, especially the processing, which is of great importance. These matters must be considered in attempting to compare the results obtained by methods different from those used in this study.

Conclusions

These studies indicate that temperature, consistence, and agitation influence the maximum strength properties that can be developed in a bleached pulp.

Their effect is, however, secondary to that of bleach ratio, which lowers in varying degrees the several strength properties. Finally, they all affect not only the maximum strength but also the way in which the strength properties change during processing,

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though not so greatly as to wholly alter the form of the strength development curve.

The conditions for producing optimum strength were represented by vigorous agitation, lowest bleach ratio consistent with the color desired, and lowest temperature consistent with the bleaching rate desired.

The effects on a bleached pulp of temperature, consistence, and agitation should be studied further by the bleaching of other typical pulps. The variations in the strength properties of the spruce sulphite pulp studied were too small in proportion to the accuracy of the methods of testing, to warrant general conclusions.

Moreover, it has not been possible to measure the hydrogen-ion concentration during the reaction. This factor has probably a very impotant effect upon the rate of the bleaching reaction, and, consequently, upon the strength and other physical properties of the bleached pulp. The alkalinity may control the reaction of the bleaching agent with the cellulose, may influence the nature and rate of solution of the reaction products formed in bleaching, and may thus act either favorably or unfavorably upon the strength producing properties of the bleached pulp. A study of the effects of the bleaching reaction with the alkalinity definitely controlled should be made to permit general conclusions.

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Report on Training for the Industry*

By H. G. Noyes, Chairman[1]

In submitting the annual report of this committee, an attempt is made to analyze the situations which have affected the work during the past year. In the light of this analysis certain conclusions which are apparently vital to the future of this phase of the Association's activities are set forth as definite recommendations for your consideration.

Following the custom adopted by a former committee, the United States was divided into 10 areas. Each area was represented by a TAPPI member who assumed charge of the work in the states making up his district.

The areas and directors are as follows:

1. Maine and New Hampshire; Fred W. Motschmann, Continental Paper & Bag Co., Rumford, Maine.

2. Massachusetts and Vermont; L. M. Yoerg, Amer. Writing Paper Co., Holyoke, Mass

3. New York, C. E. Libby, N. Y. State College of Forestry, Syracuse, N. Y.

4. Pennsylvania, M. A. Krimmel, Hammermill Paper Co., Erie, Pa.

5. Virginia and North Carolina, John D. Rue, Champion Fibre Co., Canton, N. C.

6. Ohio and West Virginia, J. J. O'Connor, Mead Pulp & Paper Co., Chillicothe, Ohio.

7. Indiana and Illinois, A. E. Bentham, Dixon Board Mills, Carthage, Indiana.

8. Michigan, M. D. Bardeen, Lee Paper Co., Vicksburg, Mich.

9. Wisconsin and Minnesota, A. T. Gardner, Combined Locks Paper Co., Combined Locks, Wis.

10. Washington, Oregon, California. No area director was secured for this district.

During the year A. E. Bentham resigned as member of the committee for the 7th area, and J. F. Shuman, Fort Wayne Corrugated Paper Company., Fort Wayne, Ind., was appointed in his place. These men together with H. G. Noyes, chairman, made up the committee.

Early in March a survey of the mills operating in the several areas was made. The objectives of the committee regarding placement of students from technical schools, colleges, and universities, during the summer months in the several mills were explained. The philosophy behind the placement idea is that if the pulp and paper industry is to profit eventually through the employment of technically trained men, these individuals make themselves more efficient through a direct contact with the industry during their school career. Such employment will give them a background of experience which will enable them to make a permanent entrance into the industry without the handicap of having had no pulp or paper mill experience. Employment during the summer months of such students also places the industry in a position to get acquainted with and to size up young men who in a few years will be available as graduates for positions in the control, operating and research departments of the paper mills. The getting acquainted idea is of value both to the industry and to the future employee.

Approximately 650 paper mills and 475 pulp mills were reached by means of the questionnaires sent out by the various committee members.

A comparatively small percentage of the firms solicited by the members of the committee cooperated in the project.

The next step in the work of the committee was to form a contact with the dean or heads of departments in the engineering schools within the areas served by the various members of the committee which would be cooperating agencies in the plan, and from which would be drawn the students for summer employment.

Several committee members made personal visits to these

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 18, 1930.

[1] Coordinator, Wisconsin Vocational School, Appleton, Wis.

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institutions while others carried on the project through correspondence.

The reaction on the part of the schools and colleges was on the whole very favorable. In some cases however, schools and universities were unable to cooperate as fully as they desired. This was apparently due to several reasons. Several of these schools and universities have placement departments, which as part of their job assume the responsibility for finding employment for their students and consequently did not feel that the cooperation with our committee was essential. In many instances other industries as, for instance, public utilities, electrical firms, the leather industry, metal working industries, the soap industry, and others were in a position to offer more definite inducements to the students than we were. As a result in some cases, the young men whom we might have placed were taken up by other industries. The committee also found that many college men who were pressed for funds to continue their education for another year or two sought employment which would offer a higher remuneration than that which we were able to offer, and did not take into consideration the valuable experience or potential possibilities of the employment in our industry.

The committee also found that there were many mills which employed local students who were enrolled in colleges and universities who took the job for the sake of the money which could be earned rather than because of any desire to continue in the industry after receiving their degree. It was also found that many high school boys who were to enter college in the fall had received promises of employment during the summer.

These facts often prevented the mills from taking on other students who might be placed through the efforts of this committee.

Several committee members arranged personal visits in the engineering schools, and held personal conferences with students together with the dean or department head in order to place before them the possibilities of summer employment. These conferences were limited because of the geographical location of the university and the time available on the part of the committee member.

The latter part of the summer follow-up letters and blanks for securing data as to the number of students employed, types of jobs, rate of pay, etc. were sent out.

The information gathered by this survey has been compiled and is available for future work in the training program of the Technical Association.

From time to time the committee members have written letters to the mills in their areas and have tried to stimulate interest both on the part of the industry and the school, which would result in more efficient work in training men for the industry. It has become very evident that many mills are agreeable to the plan now being carried on by the Technical Association and the committee on Training for the Industry will have very little difficulty in maintaining very satisfactory relations with them. However, there are many mills which have not yet been convinced of the value of the plan, and the committee will spend considerable energy in soliciting their cooperaton during the coming year.

It seems that if the pulp and paper industry is to keep up with the times in obtaining, developing, and employing technically trained men which are essential for the future of the industry, that the Technical Association should give serious consideration to the following factors which seem to be fundamental if this activity of the Association is to be of permanent value.

1. Personnel of Committee. It is obvious that no member of TAPPI would accept an appointment as a member of the committee unless he is favorable to the plan. However, the committee must be made up of men who have time to devote to the work and have prestige enough to accomplish its objectives. In order to be successful in this regard, the work of the committee on Training for the Industry must be a 12-month's job each year and the contacts with the schools and the mills should be kept up throughout the entire year.

2. Attitude of Management. It goes without saying that the Technical Association and those interested in the technical development of the industry in the various pulp and paper mills are in favor of the preparation of technically trained men for the industry. However, these men do not in every case direct the policies of the company, and unless the management favors the program of the committee and appreciates its wholesome influence on the future of the industry, the plan will fail. On the part of the industry, someone in authority in the management must be the contacting person with whom the committee on Training for Industry transacts its business. Management must be willing to devote time and attention to placement, supervision, and followup of students participating in the activities of the committee.

3. Attitude of Operating Superintendents. Cases have been brought to light where the student employed during the summer vacation has been of little or no value in production. He is often given to horse play, and sometimes apparently feels that he is not supposed to work as are other employees. This affects the morale of a department in a manner which is often disturbing. The operating superintendent should have a clearly defined picture of the program and should give it his assistance. By means of his cooperation and supervision the attitude of the student employees may be molded in such a manner as to make him a valuable cog in the operation of the plant. Student employees who fail to measure up to the standards required should be eliminated. Much of the success or failure of the permanent value of the plan will rest in a large measure upon the attitude which the operating force takes toward the program.

4. The Coöperating School. Every school and university which is to act as a cooperating agency in the work of training men for the industry must be given assurance by the pulp and paper industry that the industry is serious in its program of training. The cooperating school through the proper department head should be acquainted in detail regarding the work of the committee and the placement work and a follow up made by the committee members should be carried on in conjunction with the school. With a committee made up of men who have the time to devote to the work; with management well sold and actively interested in the program; with a sympathetic attitude on the part of the operating staff; and with a well defined program of coordination between the school and industry, the work of the committee on Training for the Industry should play a major part in the Association's activities during the coming year.

As definite steps for carrying out the program of "Training for the Industry" the following is recommended:

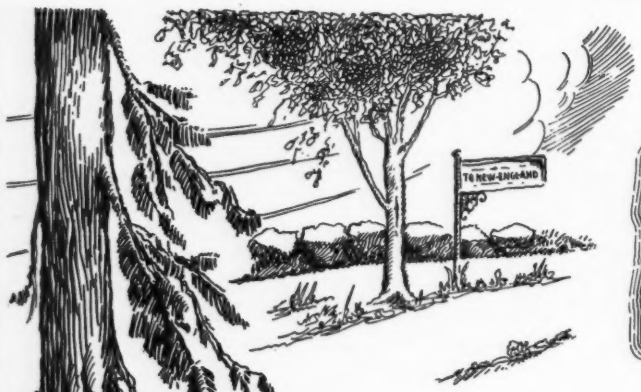
1. Direct contact with the American Paper & Pulp Association in securing the cooperation of management relative to the work of the committee.

2. Direct contact with the Superintendent's Association for the purpose of obtaining the support of operating superintendents in the placement, supervision, and followup work of the committee.

3. Immediate organization of the committee which is to carry on the work during 1930.

4. Finally, in order that the proper contacts with the other associations involved in the work may be facilitated, it is recommended that the Joint Educational Committee representing the three associations work with our committee in an advisory capacity the coming year.

The time is not far off when educational work in the pulp and paper industry will be of sufficient importance to warrant the services of a full time man who will devote his entire thought, energy, and effort to the building up of a training program. Until that time arrives the committee recommends that the Technical Association of the Pulp & Paper Industry continue its work under the direction of the committee on Training for the Industry keeping in mind the ideas presented in this report.



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Centrifugal Separation in Stuff Preparation*

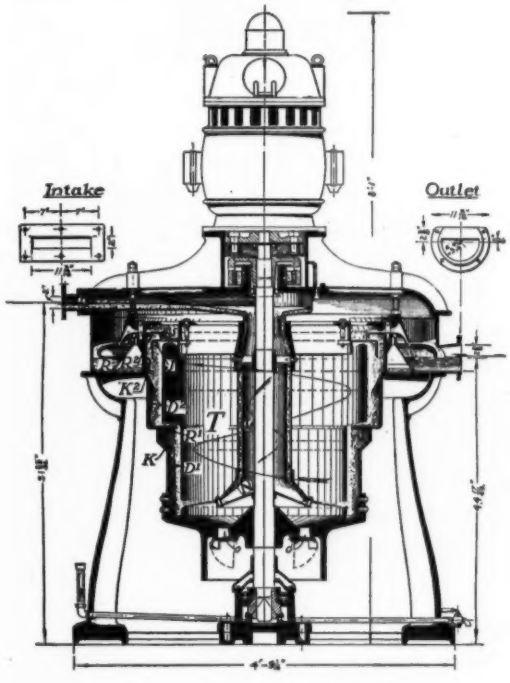
By Sven C. Lindberg[1]

All mills manufacturing either the raw materials for the paper industry or the paper itself always have been faced with the problem of manufacturing a clean product. The demand for clean products is increasing and the cleanliness of the pulp and paper is today more than ever before a very important matter in the competition throughout the world.

A writing or bond paper, for instance, must be clean to be considered good looking. The printer wants a clean sheet because dirt such as sand and chips destroys his plates; the electric industry knows that a clean sheet contains the least number of conducting particles and therefore provides the best insulation and so on.

All devices applied for this purpose, sand traps, rifflers, magnetic separators, screens, never gave entirely satisfactory results. Only larger dirt particles were taken out by these different forms of equipment. None of them entirely removed microscopic particles or light floating impurities.

The sand traps and rifflers are of the gravity type through which the stock is flowing slowly, the heavy dirt settling and trapped by means of suitable pockets.



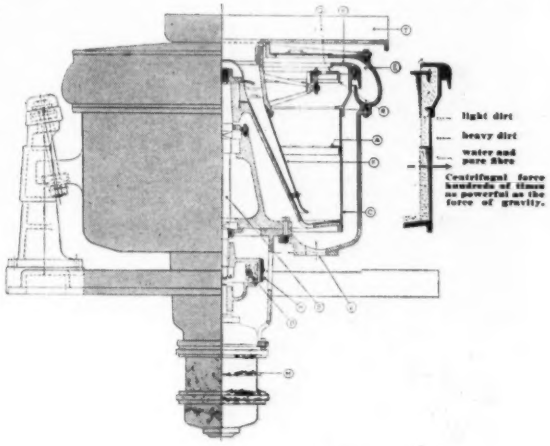
Section through Erkensator

The paper machine screens, of course, play a large part in removing dirt, but these, of course, work on the principle of separation by size, and consequently cannot remove dirt from the fibers that are of smaller size than the width of the slot in the screen plate. The screens also prevent lumps and snags from passing to the headbox of the paper machine, and will be required for the same purpose when centrifugal separators are used, although, perhaps, with larger slots.

The operating principle of the centrifugal separator is similar, which can be easily understood when viewing a cross section of the machine.

In addition to the baffles trapping the heavy dirt, a baffle has been designed which skims off and removes the light dirt floating on the surface.

The difference between the older types of equipment and the centrifugal separator is that the latter operates by means of centrifu-



Section of Bird Centrifiner

gal forces rather than by gravity and its effectiveness is thereby multiplied many times.

Operating Principles

It is easy to see why this separation is so efficient, why every particle of foreign matter is whirled out of the stock.

The main operating part of all types of centrifugal separators is a basket driven by a direct connected motor.

The stock is delivered to the lower end of the basket through a charging pipe. As soon as the stock comes in contact with the basket, the centrifugal forces assert themselves.

The stock acquires peripheral speed and rises evenly up on the walls. The first fibers entering the basket will form a dense mat under the different baffles along the walls of the basket.

The stock that now is fed to the machine will float in the form of a hollow cylinder over the mat and over all of the baffles out into the discharge.

In practically all cases the specific gravity of the foreign matter is different to the specific gravity of the fibers. This causes the heavier foreign material to be driven by the centrifugal force to the outside of the whirling cylinder of stock. The heavier particles are deposited first on the face and then through the entire section of the mat, and under the baffles.

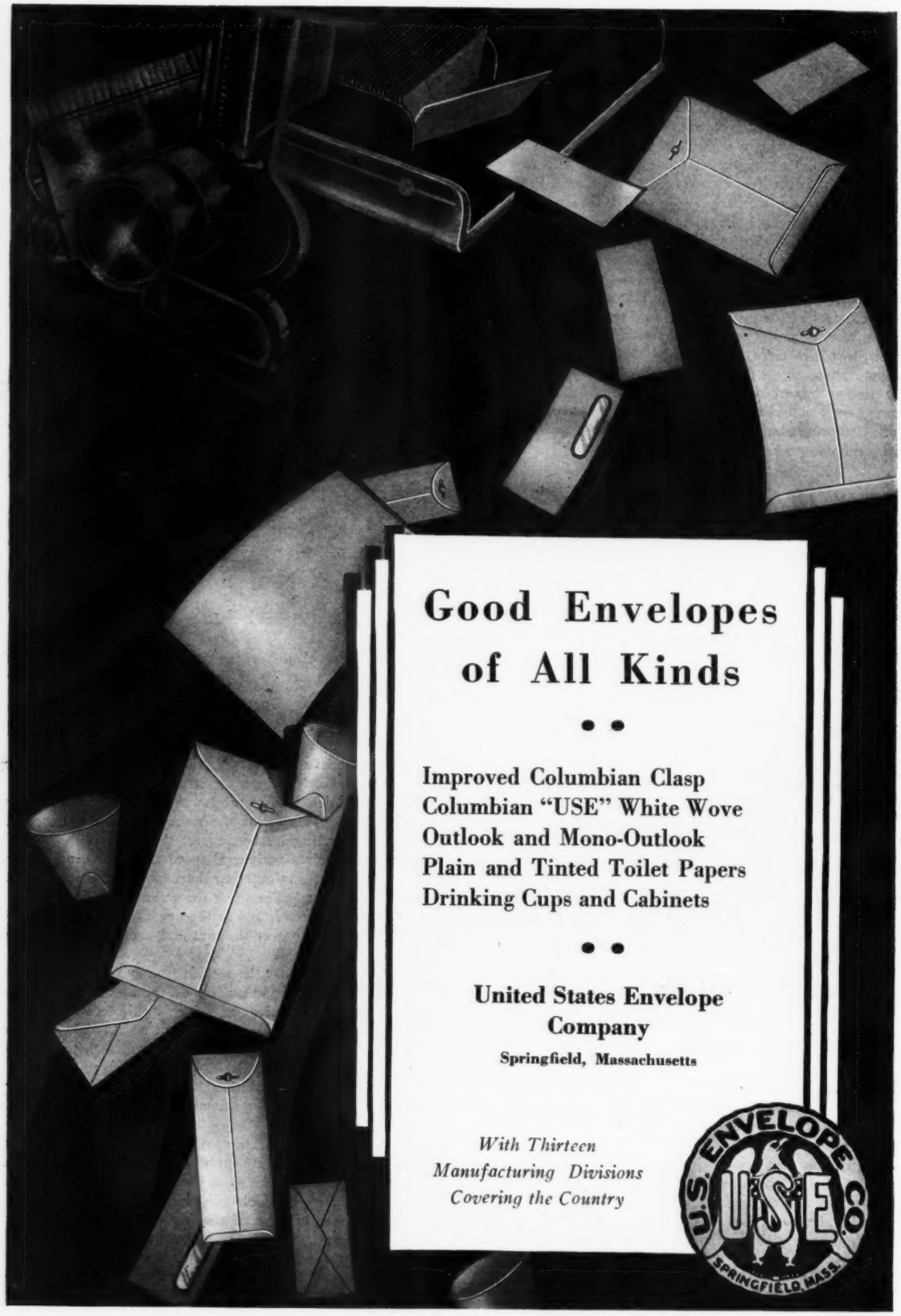
The lighter foreign materials keep to the inside of the whirling cylinder where they are skimmed off and held back by the skimming ring.

Examining the mat after a run, it often is found to contain shives and small pieces of broke or other foreign matter which have the same specific gravity as the fibers. This can be explained since these particles, which are larger than the fibers, are held back by the mat because of the higher friction as compared to that of the fibers.

In passing through the centrifugal separator, the paper stock is not only separated from the foreign material but is also subject to a "brushing out" action in passing over the various baffles. This

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 19, 1930.

[1] Member TAPPI; Consulting Engineer, Centrifugal Engineering and Patents Corp., New York, N. Y.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definitely causes a fiber bundle separation without shortening the lengths of the fiber. The result of the fiber separation gives improved formation and higher strength tests.

Impurities removed from the stock and retained in the separator are washed out at regular intervals. When cleaning the separator it is shut down and all the material in the machine is washed out through openings provided in the bottom of the basket. At the same time the entire machine can be thoroughly cleaned.

Centrifugal machines have been used for separating materials of different specific gravity for at least a half century. But the first man to apply centrifugal separation principles to paper stock was Hermanus Thomassen, a Dutch engineer. The late Paul Erkens of J. W. Erkens, Dueren, Germany, recognized the importance of this idea for the paper industry and started in 1920 the developing of a centrifugal separator which is now known under the name of Erkensator and is running in mills in all paper making countries. In the United States the Bird Machine Co., South Walpole, Mass. and the Tolhurst Machine Works, Inc., Troy, N. Y. are building the centrifugal separators, working on the same principles as the Erkensator. These machines are the Bird Centrifiner and the Tolhurst Paper and Pulp Centrifugal.

Capacity of Separators

The capacity of centrifugal separators marketed by the above mentioned firms is solely determined by the volume of liquid, paper or pulp stock, passing through the machines The various separators have a capacity ranging from 5000 to 7000 U. S. gallons per hour. The percentage of dry stock carried in this volume of liquid paper stock determines the capacity of the separator in pounds per hour.

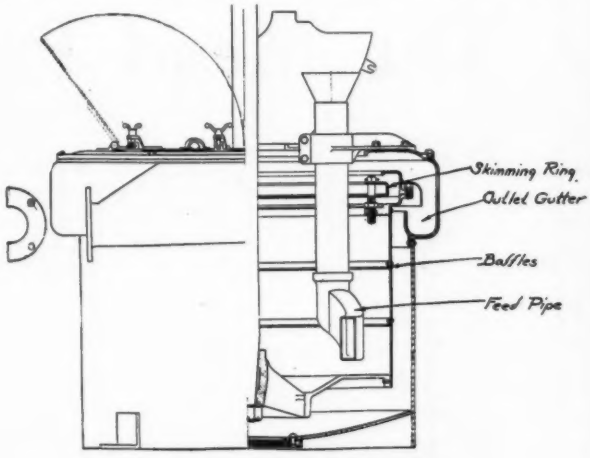
The separator treating 7,000 gallons per hour has the following various capacities depending upon various consistencies of the stock.

View of Bird Centrifiner

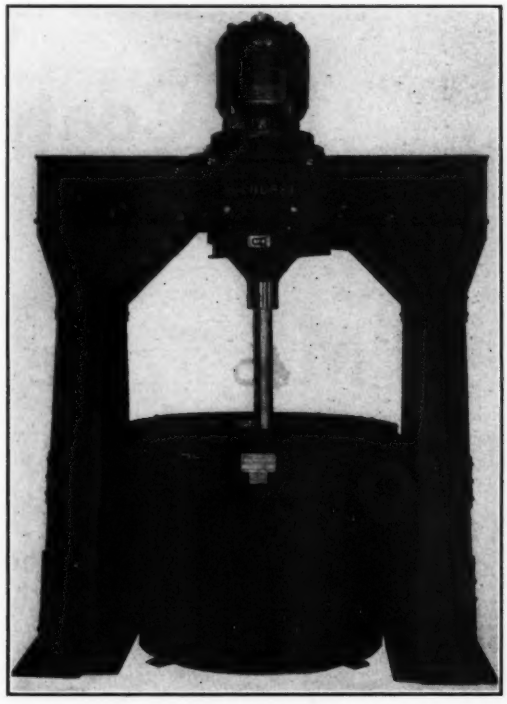
Per cent Consistency	Capacity pounds per hour
.25	145
.40	230
.50	290
.60	350
.75	435
1.00	580

To get proper results centrifuging paper stock, the stock must be run through the machine at the right consistency. This consistency varies with each furnish and is in direct proportion to the lengths of the fibers and also to the kind and fineness of the foreign materials which are to be removed by the separator. The longer the fiber and the finer the foreign material, the lower should be the consistency.

There is a limit in diluting the stock for each different furnish fixed by the conditions under which the stock is run over the



Section of Tolhurst Clarifier



View of Tolhurst Clarifier

wire of the paper machine. The conditions are the freeness of the stock, the wanted formation, and the required weight of the sheet.

This limit determines the lowest consistency with which the stock may be centrifuged. Consequently the only variation possible is to run the stock through the separator in a higher consistency. This can be made possible by dividing the white water needed for diluting the stock in two parts. The first part of the white water is added before, the rest after the separator. In this way the most favorable conditions can easily be obtained.

As mentioned before the capacity of the centrifugal separators

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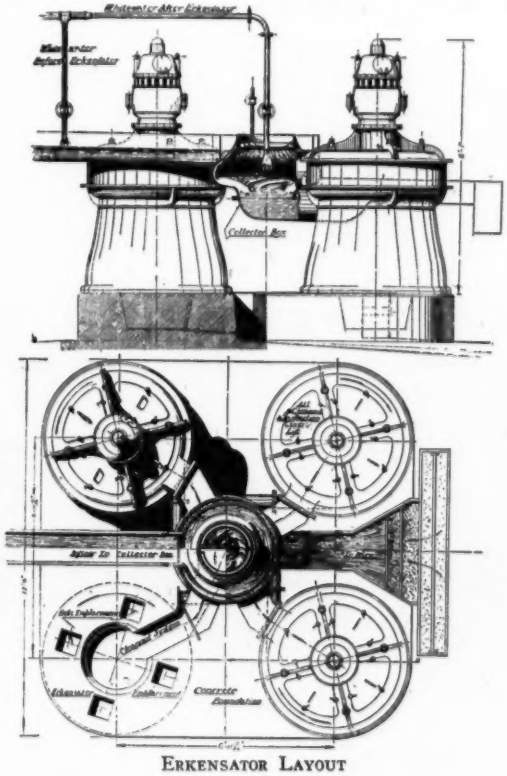
ranges from 145 to 580 pounds per hour. As the production of most paper machines is higher, it will prove necessary to install two or more separators to take care of this output. In this case the separators are grouped about a collector box. The stock coming from the stock chest after being mixed with white water, flows to the upper outside part of the collector box and is distributed through regulating gates to the separators. After passing through the separators, the stock is returned to the lower part of the collector box and flows from there either to the screen or directly to the machine head box. By means of the regulating gates the amount of stock which passes every siugle separator can be adjusted exactly so as to have the same load at each machine.

The lower part of the collector box is constructed as a reservoir which not only takes care of the overflow from the separators but also provides enough room that white water may be added if a higher dilution is wanted on the wire than the stock has passing through the separators.

In places where the floor space or other conditions do not permit installing the centrifugal around a collector box they may be placed in one of several rows and fed and discharged through a system of flumes and pipes.

Cleaning Centrifugals

The dirt removed from the passing paper stock is kept back in



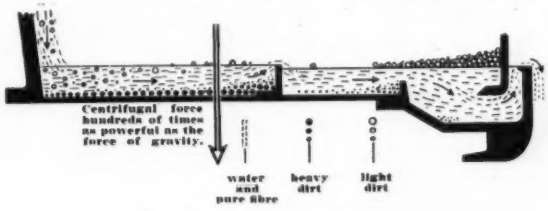
ERKENSATOR LAYOUT

the machines and has to be washed out at intervals. The time between the wash-ups depends on the amount of dirt in the paper stock. Treating rope stock, for instance, it will be necessary to clean the machines every twelve hours. Running on a clean rag stock, the separators may be run for thirty hours or more without any dirt passing out of the machines.

To wash a separator, it must be stopped. Then the machine is cleaned out with a hose and can be returned to service in from two to three minutes.

Most of the mills want to have the paper machines running from Monday to Saturday if possible without shut-downs. The question came up if this would also be possible, when centrifugals had been installed on the paper machine because they have to be cleaned in intervals.

When there are more than one centrifugal running on one paper machine and the installation has ample capacity so that when one centrifugal separator is shut down for cleaning the rest have ample capacity to take care of the whole load, the continuous run of the



CENTRIFINER ACTION DIAGRAM

paper machine will not be disturbed at all. It may be mentioned that in some mills after centrifugals had been installed the continuous run of the paper machine during the week had been increased, because the wire was kept much cleaner.

VIEW OF ERKENSATOR

After one machine is washed up and put into operation again it is obvious that during the period when the mat is being formed some of the stock which should go to the paper machine, stays in the centrifugal. This naturally will vary the weight on the paper machine a little. This might appear as a serious difficulty, but in talking with those familiar with the use of centrifugals this fact does not appear as a particular problem.

To overcome the above mentioned change in weight a pail of stock may be thrown into the centrifugal when starting up. One mill for instance has made an arrangement that stock can be drawn from the head box to fill up the centrifugals.

In both ways the additional stock will form the mat and will cut

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down the amount of variation in the weight of the paper machine. The loss of stock in each separator amounts to about ten pounds of dry weight.

The stock washed out of the centrifugal separators may not be considered as to be entirely lost, although many mills run it into the sewer. One mill manufacturing high grade rag papers succeeded in recovering the stock by putting it back into the washers. Another mill which has thirty four centrifugals running on sulphite condenser and glassine collects all the stock washed out of the separators in a drainer and from this stock all the wrapping paper consumed by this mill is made.

Operating Data

The power required to drive the centrifugal separators is relatively small, both motor and basket are run on ball bearings. The consumption of power for one separator amounts to 5 to 7 horsepower.

The speed of the basket is 560 to 600 revs. per min.

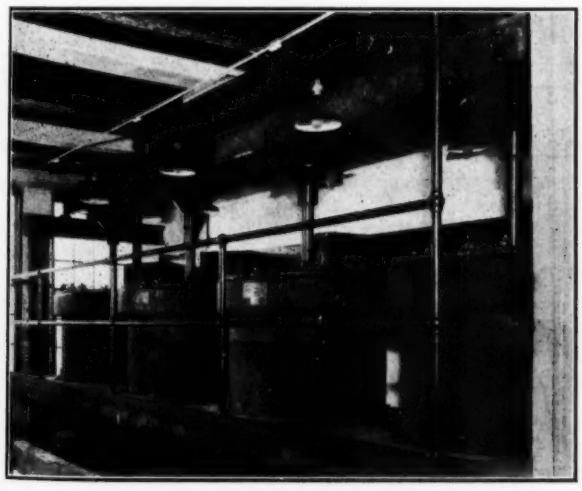
All parts of the separators such as the basket, intake and discharge channels which come in contact with the stock are made of copper alloys to avoid corrosion. When the motor and the ball bearings are properly attended to the maintenance will be so low as to amount to practically nothing.

Mill Installations

The various tests made by the mills give a very good idea of the efficiency of the centrifugal separators. More than 600 centrifugal separators have been installed in pulp and paper mills.

On an installation of tissue paper the dirt counted on one test before the separators were put in, consisted of 161 shives, 477 dirt spots, 4 slime spots, and 4 dirt spots large enough to break the sheet. After the separators were installed the dirt counted on the same number of sheets consisted of 101 shives, 55 dirt spots, 3 slime spots and no dirt spots large enough to break the sheet.

In another mill before the centrifugal separators were installed,



Tolhurst Clarifiers in Paper Mill

the dirt spot test showed an average of 40 spots for a given area. After the installation had been put in operation an average of only 8 dirt spots were counted for the same area and these spots were so insignificant that they were hardly noticeable.

In the sorting room the efficiency of the separators can easily be checked. For instance in one mill the percentage of first grade sheets was increased from 55 to 97 per cent and in another mill the percentage of firsts, seconds, and throw outs before and after installing centrifugal separators was as as follows:

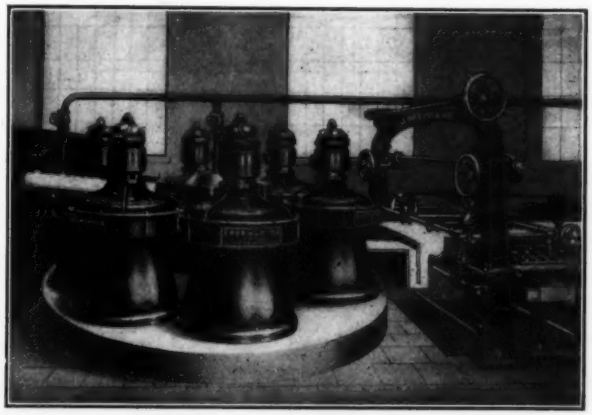
Before the installation:

75 to 80 per cent	First grade sheets
10 to 15 per cent	seconds
10 per cent	throw outs

After the installation:

85 to 90 per cent	First grade sheets
5 per cent	seconds
5 per cent	throw outs

This mill reported that by increasing the first grade sheets to that



Battery of Erkensators

extent the whole installation would be paid off in about six months.

The centrifugal separator runs with success on rope papers, particularly insulating papers. Reports of the mills show that on this grade centrifugal action has not only cleaned the sheet, but also removed from it practically all of the oils and greases which are usually found in rope stocks.

On the rope grades as well as on condenser papers, the dielectric properties have been materially increased due to the almost complete removal of dirt. The mat taken out of a centrifugal treating condenser stock showed hundreds of microscopic particles of brass. These particles were not removed by either the sand trap or the magnetic separator, both of which were still in operation before the centrifugal separator. In addition to cleaning the sheets the centrifugal separators separate and refine the bundles of fibers.

This fiber separation and refining action is caused as mentioned before by the fibers passing over various edges of the baffles and rings of the baskets of the separators at very high speeds. This action has the desired effect, so that it is possible to get a much better formed and more closed sheet and a stronger test than before.

A bond paper mill reports an increase of 30 pounds in the Mullen test. A tissue mill stated an increase of 35 per cent in the Mullen test, whereas a European cigarette manufacturer mentioned that where they had been able to run 30,000 cigarettes in an hour on their machine before centrifugal separators were installed in the paper mill, they now are able to run 40,000 cigarettes per hour, after the paper had been put through the separators. All of this was due to a much better formation and more uniform strength permitting faster operation of the cigarette machines without breaks.

On tissue paper a noticeable improvement is in the elimination of small holes in the sheet, sometimes known as sand holes. The entire elimination of all heavy foreign material makes the above possible.

Supplementary Advantages of Centrifuging

The fact that centrifugal separators will remove such materials as mentioned, decreases the importance of rag sorting. Sometimes it is possible to use an inferior furnish. Where separators are used on stock which must later be bleached, as for instance, un-

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bleached sulphite, the centrifugal separators have a cleaning effect which often reduces the amount of bleach which it is necessary to use.

It is remarkable that the separators also remove all resinous matters from unbleached sulphite. It has also been noticed that the color of pulp and paper stock which has been handled in separators is brighter than before, due to the thorough cleaning action of the machine.

A further advantage of the use of centrifugal separators is the possibility of introducing save-alls more extensively into the fine mills. At the present time on high grade rag, practically no return water is used for beaters. These are furnished entirely with highly filtered fresh water, simply because these mills feared the introduction of dirt due to the reuse of white water. Since the centrifugals have been introduced these same mills find that they can reuse not only recovered fiber but also white water, because any danger of introducing dirt in this way is entirely eliminated.

The question of separating clay will come up but it has been shown that clay which has been properly ground and properly mixed in the stock is so fine that the centrifugal force employed in the centrifugal separators is not sufficient to separate this clay from the paper making fiber. Such clay, however, which has not been properly ground or screened and which may be in the stock in larger pieces will be separated by the centrifugal and this of course is an advantage rather than a disadvantage.

It has also been noticed that on some grades of paper where pigment colors are used there has been a tendency to separate this color by centrigual action. However, in these cases a substitution of a different type of color which will imbed itself more firmly in the fiber has entirely eliminated this difficulty, or instead the furnish of color might be slightly increased and this also will overcome the above difficulty.

An old paper maker when asked how he liked the centrifugal separators after he had them in operation in his mill for a few weeks answered, "I feel a perfect relief. When I do have some dirt in the paper now, I don't need to turn my whole mill upside down, chase from the rag sorting room through the whole plant to find the source of the dirt appearing in the paper. There can be only one place and that is in the paper machine room after the centrifugals and it usually takes me now half an hour to get rid of the dirt and have a sheet running on the machine clean as I never knew before."

Report of Corrosion Committee*

By J. D. Miller, Chairman[1]

This month represents the completion of the first year of the Corrosion Committee functioning as an individual unit. The title infers the consideration of corrosion problems in each of the pulping processes, covering the process equipment, protection of building interiors, bleach plant and other special problems.

The field of activity is large and we regret that the work of the past year has been confined to a large extent to the process equipment of the sulphite industry.

It is a bit difficult to give an accurate estimate of the magnitude of that particular problem. If we may draw from the results of the corrosion survey compiled by the committee from the corrosion questionnaire of last year, only one-third of the contributors offered an estimate in reply to the question, "What is the value of the corrosion loss, (materials at sulphite mill only) expressed in dollars per year per ton daily production?" The range of the replies was great, but the average of the values clearly representing direct replies to the question was $98.75. For example, a mill rated at 50 tons per day would have a replacement bill of $4937.50 annually. To this figure must be added the labor charge and loss in production, which would appreciably increase the above figure.

This major replacement has received considerable attention from the metallurgical industries. During the past year the efforts in the ferrous alloy field were well set forth by John A. Matthews before this convention a year ago, and by Lee Wallis Gibbons at the TAPPI Conference at the Twelfth Exposition of Chemical Industries, last May in New York.

Results of Survey

The interest in the ferrous alloys is shown also by the survey from which the following is taken, indicating the percentage of contributors who investigated the alloys at the specific points:

Burner gas to cooler...	8.6 per cent
Cooking acid pump body	2.9 per cent
Acid valves	5.7 per cent
Relief valves	5.7 per cent
Gas fan	2.9 per cent
Acid pump impeller....	11.4 per cent
Digester head-liner	2.9 per cent
Blow lines	14.3 per cent

The industry is apparently feeling its way on these alloys. In many cases, results from the ferrous alloys have been irregular.

These irregularities may be traced in part to metal variation, since the alloys are greatly influenced by the thermal treatment following fabrication. Progress is being made in this technology, as well as that of the fabrication of the alloys. Cases of apparent electrolytic action having caused failure are on record. This point is worthy of careful investigation, under operating conditions, as ultimately the problem of a satisfactory joining of the alloy to non-ferrous alloys arises.

Ferrous Alloys

The ferrous alloys of the 18-8 Cr. Ni. type, with or without Mo. have demonstrated that when properly prepared, they represent the best metals offered to date for resistance to sulphite corrosion. Continued progress in the technology of these alloys may permit the sulphite equipment to be a permanent installation, with replacements negligible as compared to present practice. The initial cost will be high but warranted in the light of attendant advantages.

The "Materials of Construction for Chemical Engineering Equipment" Chart issued with Chemical and Metallurgical Engineering of September is of interest to the general problem, although neglecting the sulphite industry. Through the courtesy of McGraw-Hill Publishing Co., a note appeared in November Chemical and Metallurgical Engineering inviting the manufacturers of corrosion resistant materials to cooperate with the Committee in investigating their products when applied to sulphite conditions, in the corrosion chamber test.

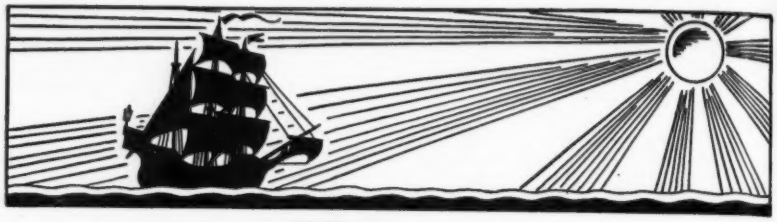
Cooperative Work

Response to the invitation has been most gratifying, and the research departments of several nonferrous alloy manufacturers have prepared series of samples in which the analysis has been varied according to a plan. The ferrous alloy manufacturers have also responded. The most elaborate program undertaken has been by a company who submitted a series of sixteen samples definitely varied in composition, as a start. Each series is tested independently at the three stations established by the committee.

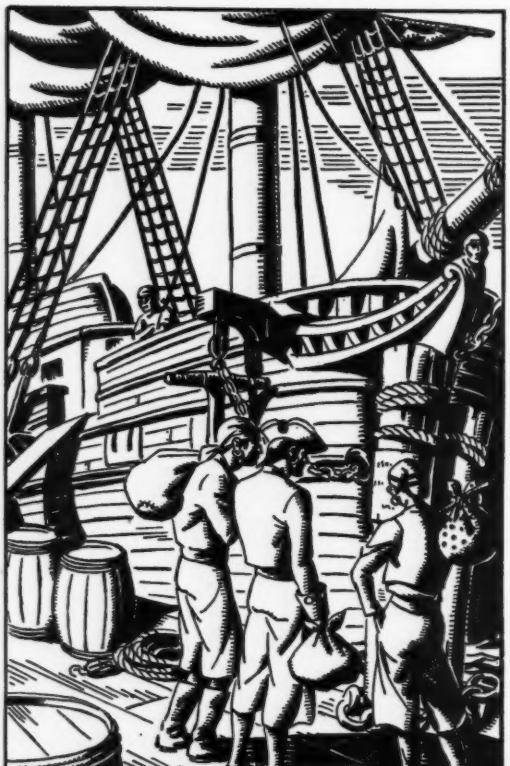
The result of this activity is uncertain. While the non-ferrous manufacturers are not crowded out of the picture at present, it is possible that improvements in the corrosion resistance in that field may be obtained. The cooperation between the committee and the research departments is to that end, and if attained, would ultimately result in a reduction of the corrosion bill of the industry.

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 19, 1930.

[1] Chief Chemist, York Haven Paper Co., York Haven, Pa.



CASLON BOND



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Bibliography of Papermaking for 1929

Committee on Abstracts and Bibliography, Contribution No. 52

By Clarence J. West, Chairman

List of Journals Covered

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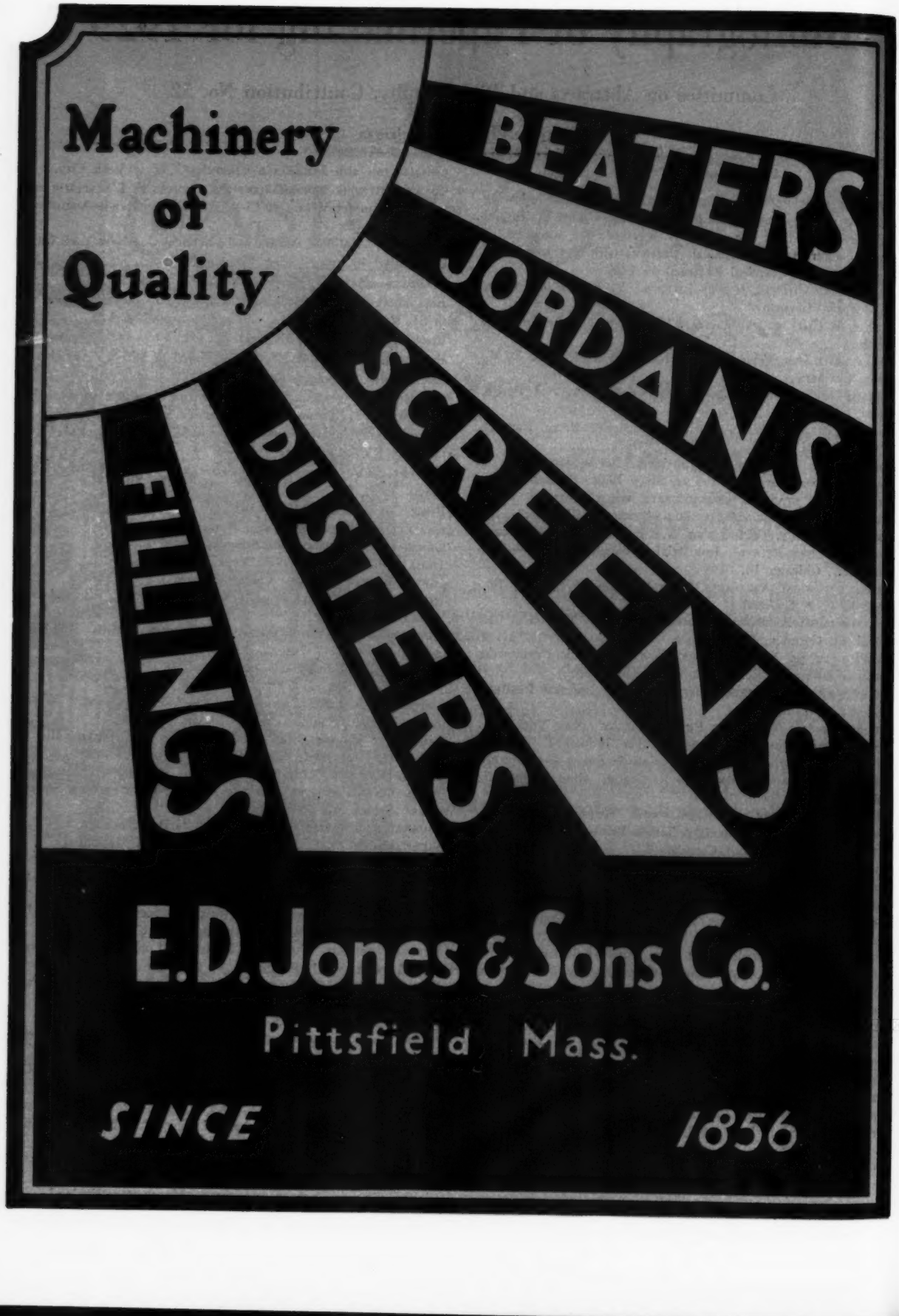
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Pittsfield Mass.
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The papermaking literature of the year is arranged under the following topics:

General
Adhesives
Alkaline processes
Analytical
Art paper
Associations
Bagasse
Bamboo
Barkers
Bearings
Beaters and beating
Belts
Bibliography
Black liquor
Bleaching
Blotting paper
Boards
Carbon paper
Cellulose
Cellulose-Analytical
Chlorine Process
Cigarette paper
Clays
Coated papers and coating materials
Colloids
Corn stalks
Corrosion
Costs and cost accounting
Digesters
Drying
Durability
Dyes
Education
Electric power in papermaking
Eucalyptus
Felts
Fillers
Filter paper
Filters
Forestry
Handmade papers
History
Hydrogen ion concentration
Insulation papers
Kraft paper
Laboratories
Lignin
Logging
Losses
Lubrication
Machinery
Machines-Power requirement
Mechanical handling
Mechanical process
  Grinders
Mills
Nitric acid process
Paper
  General properties
Paper testing
  General
  Brittleness
  Bulk
  Chemical analysis
  Color
  Fibers
  Fluff
  Gloss
  Humidity, effect of
  Metals, action of
  Microsope
  Opacity
  Porosity
  Roofing felt
  Stiffness
  Strength
  Thickness
Paper making materials
Parchment paper
Photographic paper
Pine wood
Pipes and piping
Power
  General
  Electric power
  Steam power
    Accumulators

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Freeness
Moisture
Pitch
Strength
Pulpwoods
Pumps
Rags
Recording instruments
Research
Rolls
Roofing felts
Sack papers
Safety
Safety papers
Savealls
Screens
Shipping of paper
Sizing
Slitters and rewinders
Soda process
Specialties
Standardization
Starch
Statistics
Straw
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Trade
Washing
Waste
Water
White water
Wires
Wood room

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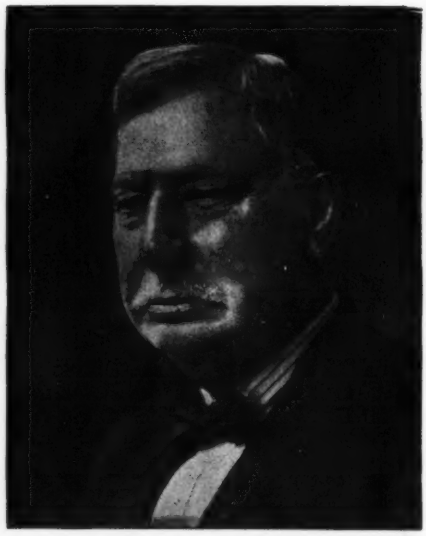

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	Butyl Acetate			X	
C	Calcium Brine				X
	Chlorine		X		
	Citric Acid	X			
	Compressed Air	X			
	Creosote (Coal tar)		X		
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	Ethyl Alcohol (Grain alcohol) (Concentrated & dilute)		X		
G	Gasoline			X	
H	Hydrochloric Acid (Muriatic)		X		
	Hydrogen Peroxide		X		
K	Kerosene			X	
L	Lactic Acid		X		
	Lime		X		
	Lime Sulphur		X		
M	Methyl Alcohol (Wood alcohol) (Concentrated & dilute)		X		
	Mineral Spirits			X	
N	Naphtha			X	
	Nitric Acid		X		
O	Oleic Acid	X			
	Oxalic Acid	X			
P	Palmitic Acid	X			
	Phosphoric Acid		X		
	Potassium Carbonate (Potash)		X		
	Potassium Cyanide		X		
	Potassium Sulphide		X		
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	Sodium Sulphide		X		
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	Sulphurous		X		
	Salt Cake		X		
	Stearic Acid	X			
	Steam (High pressure, superheat)	X			
T	Tannic Acid	X			
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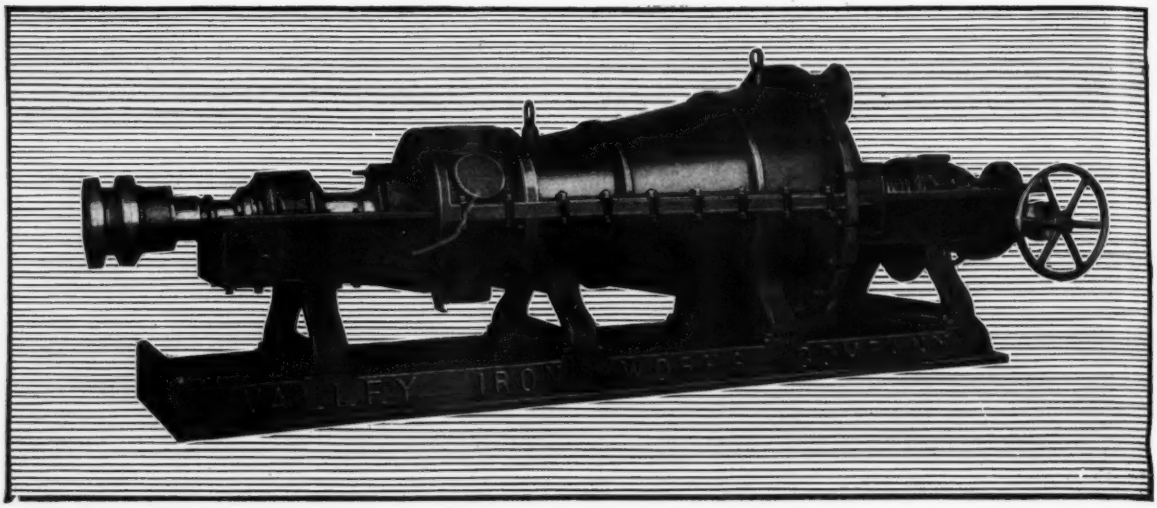

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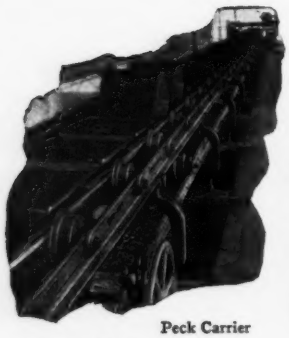

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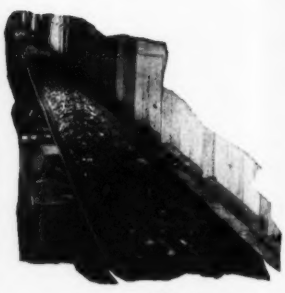

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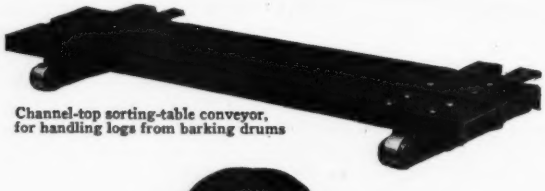

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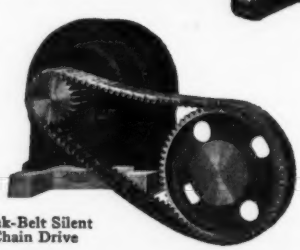

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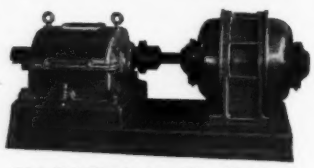

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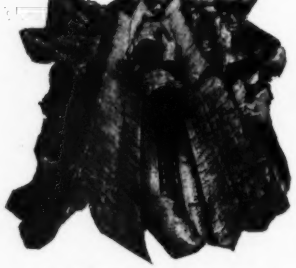

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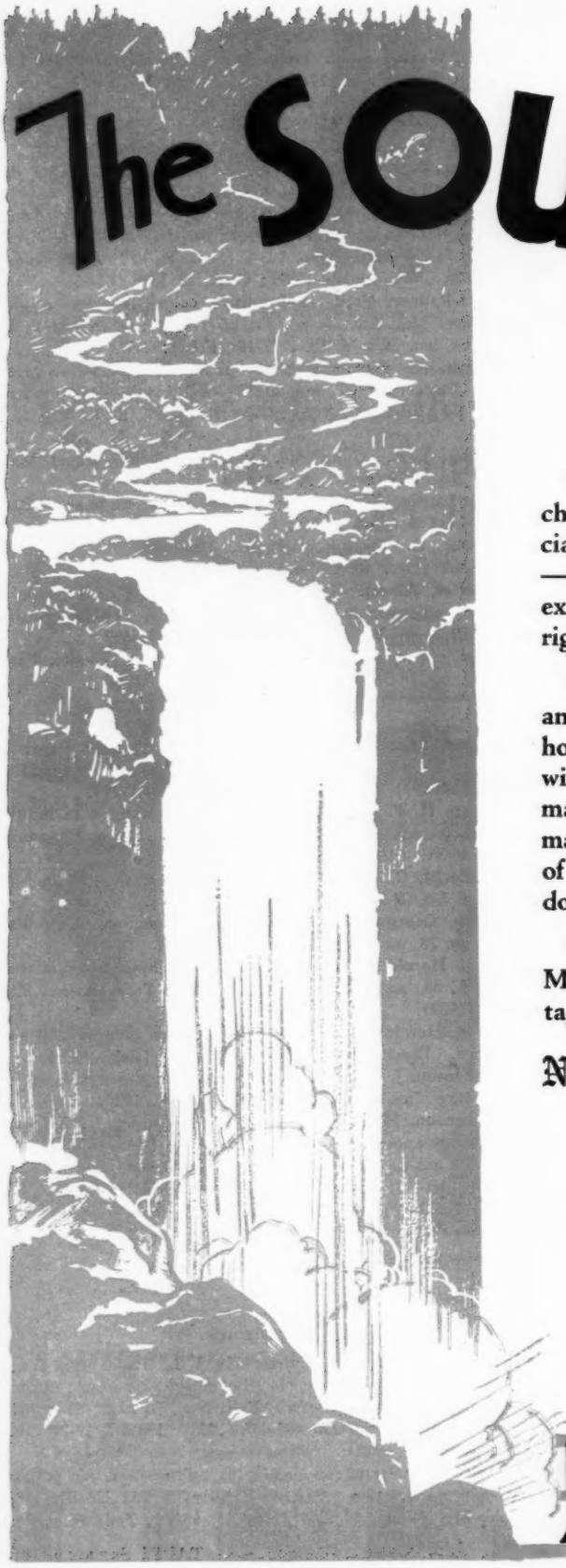

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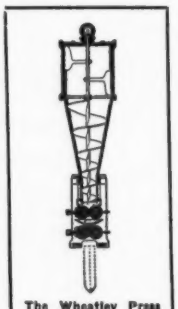

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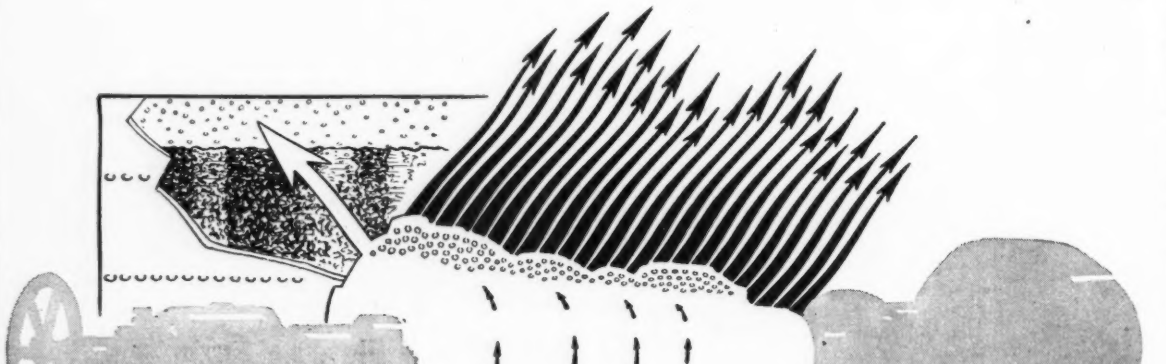

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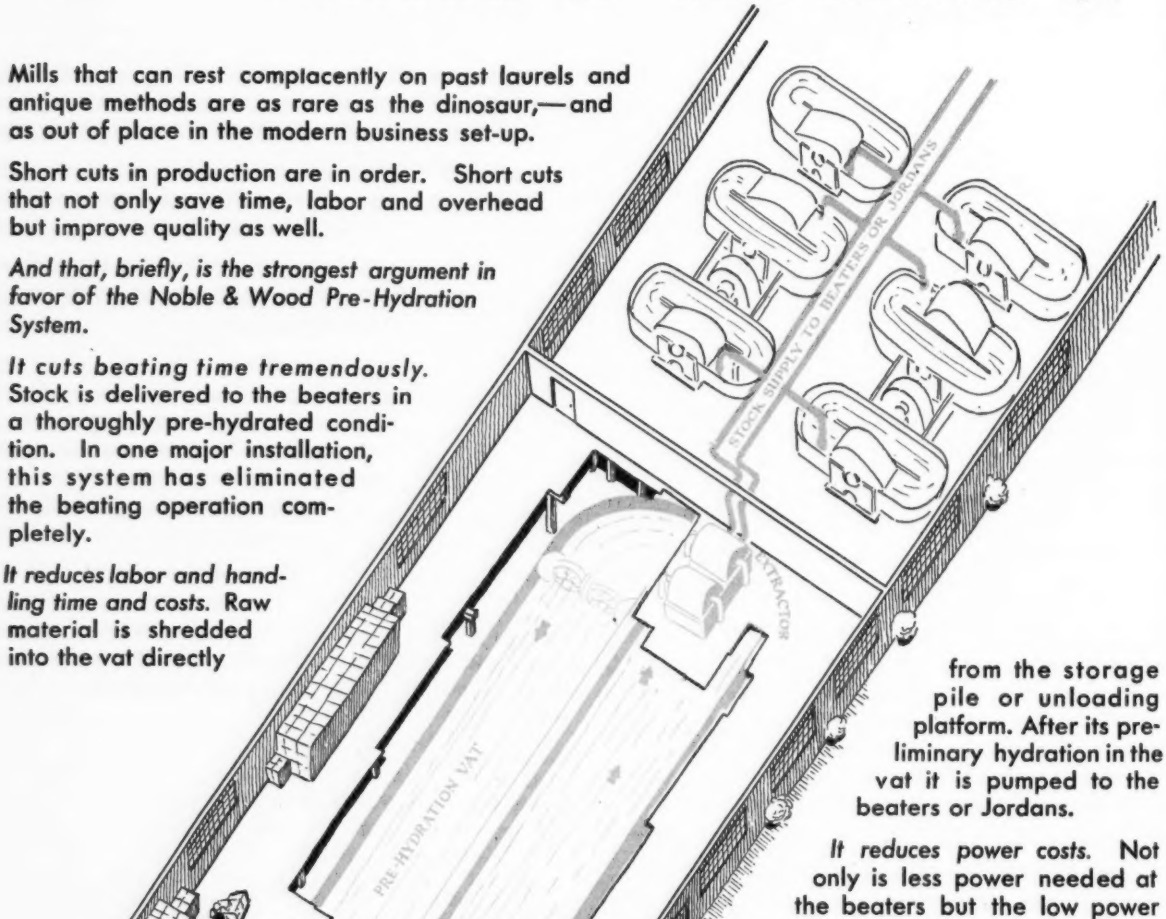

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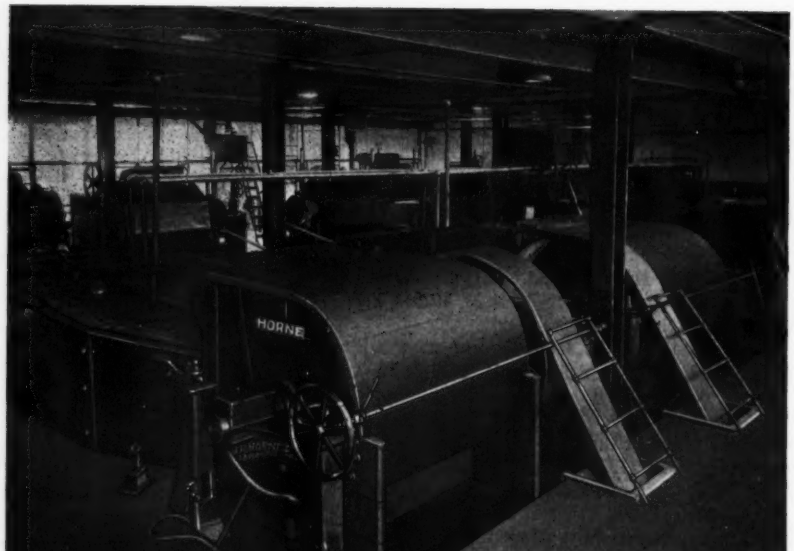

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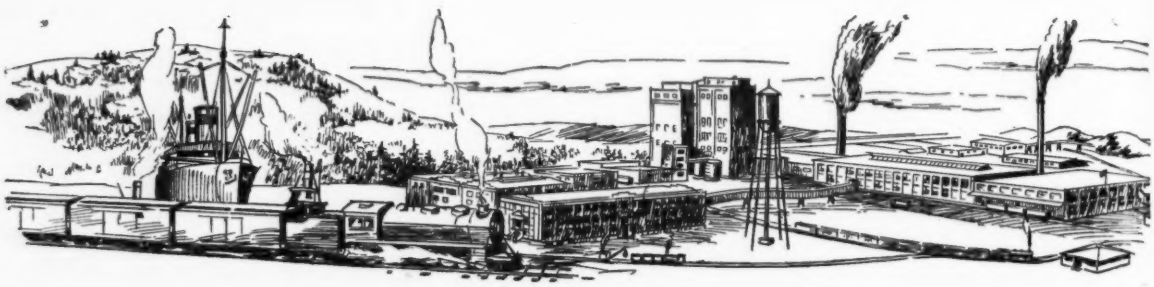

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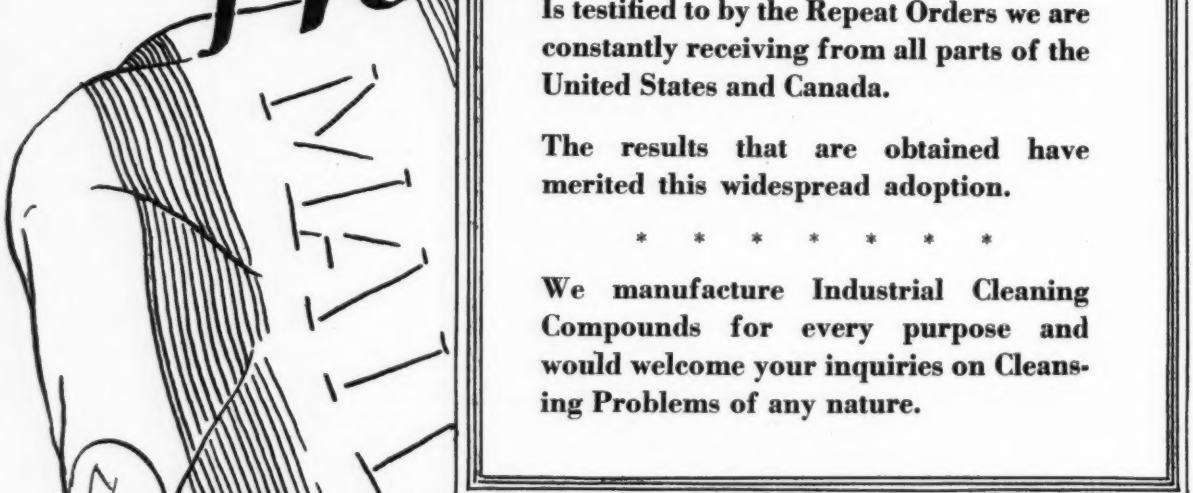

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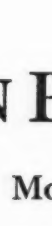

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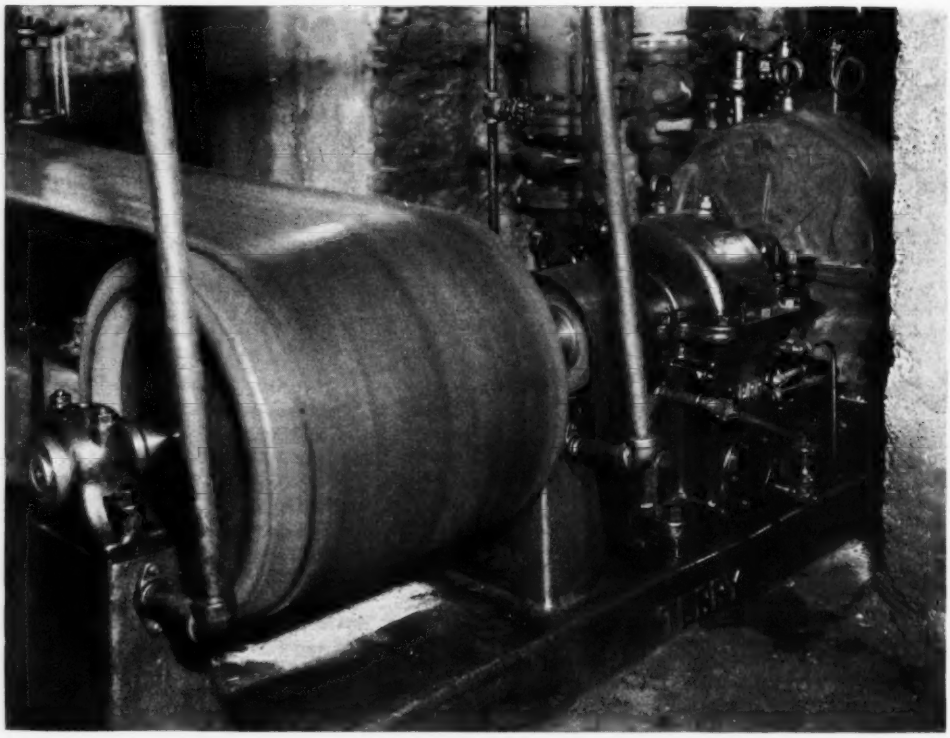

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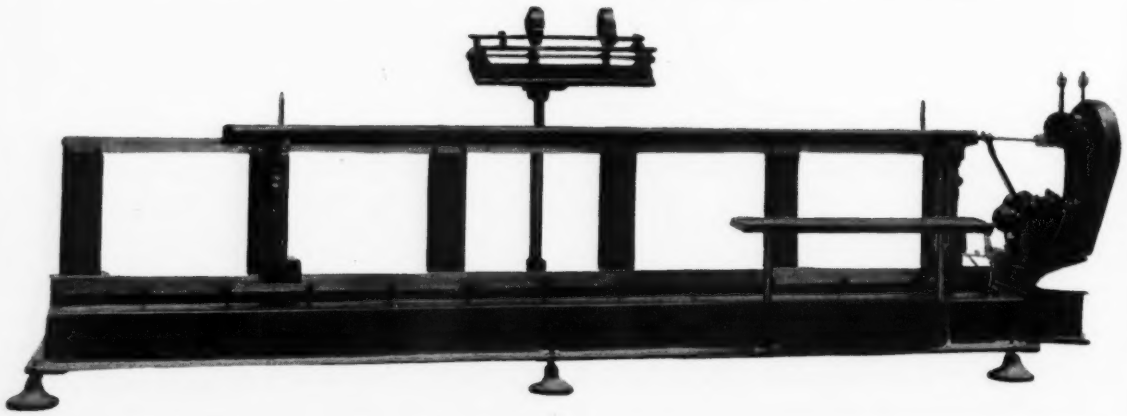

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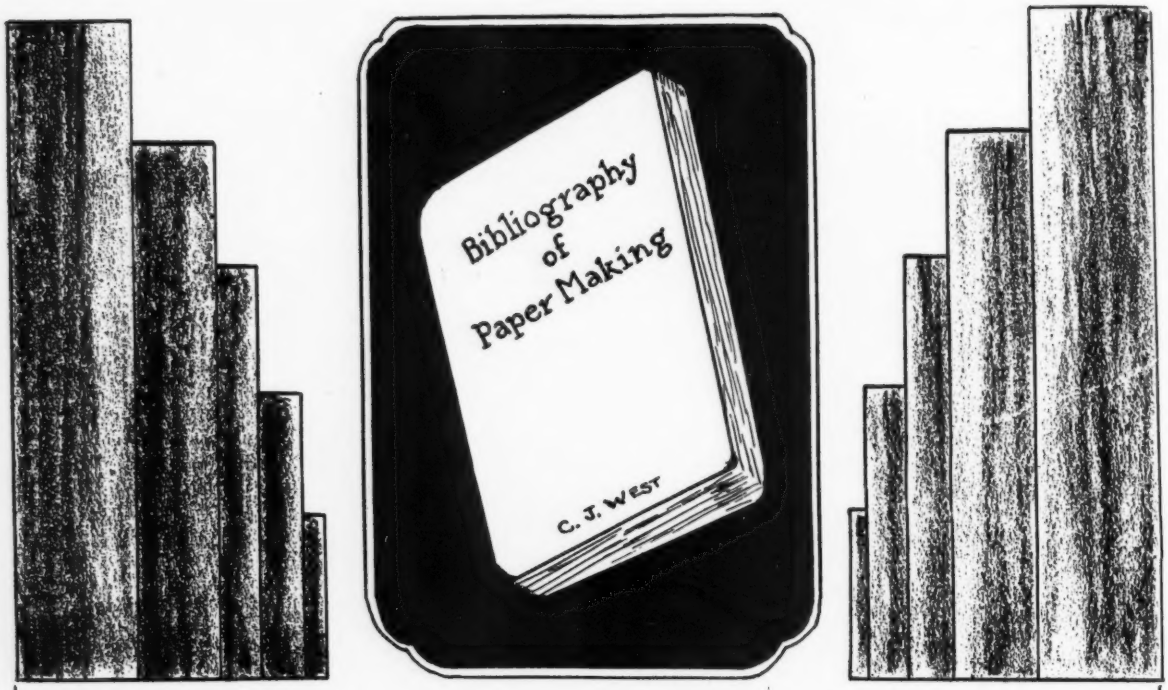

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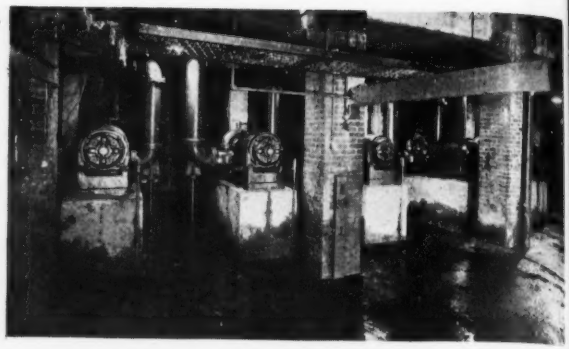

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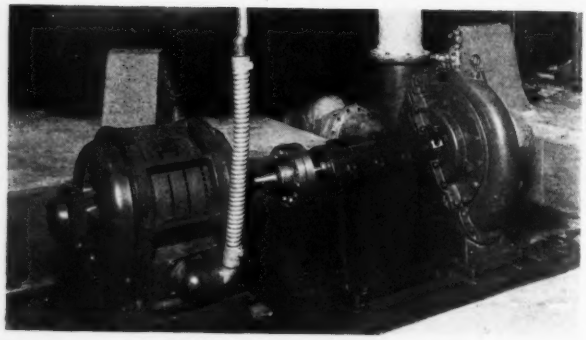
69% repeat orders from pulp and paper mills in 6 years . . . proof that Warren Pumps are built to live up to the claims made for them.



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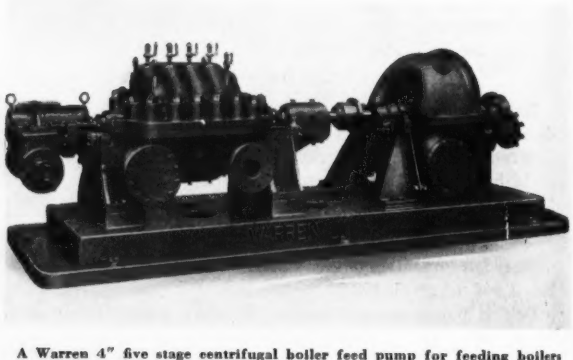

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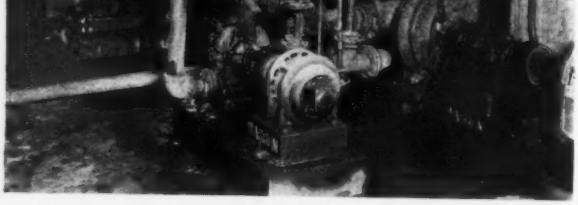

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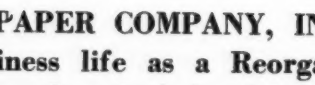

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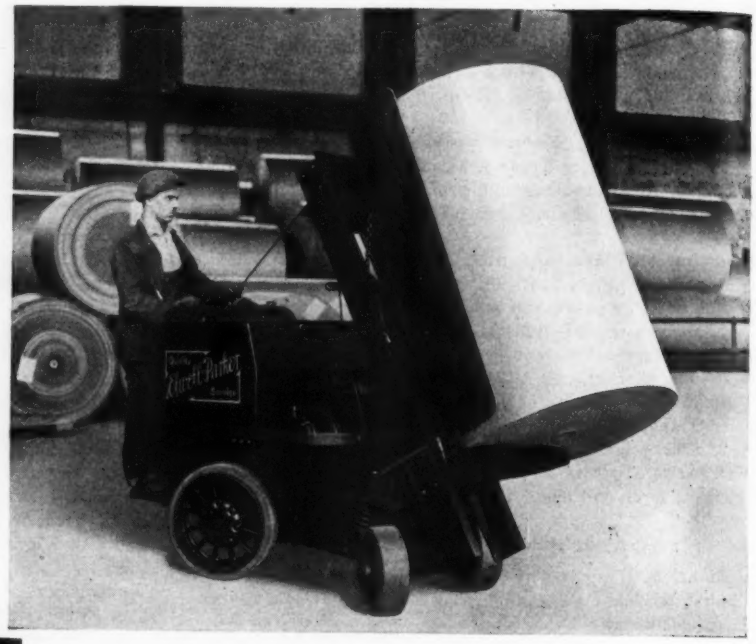

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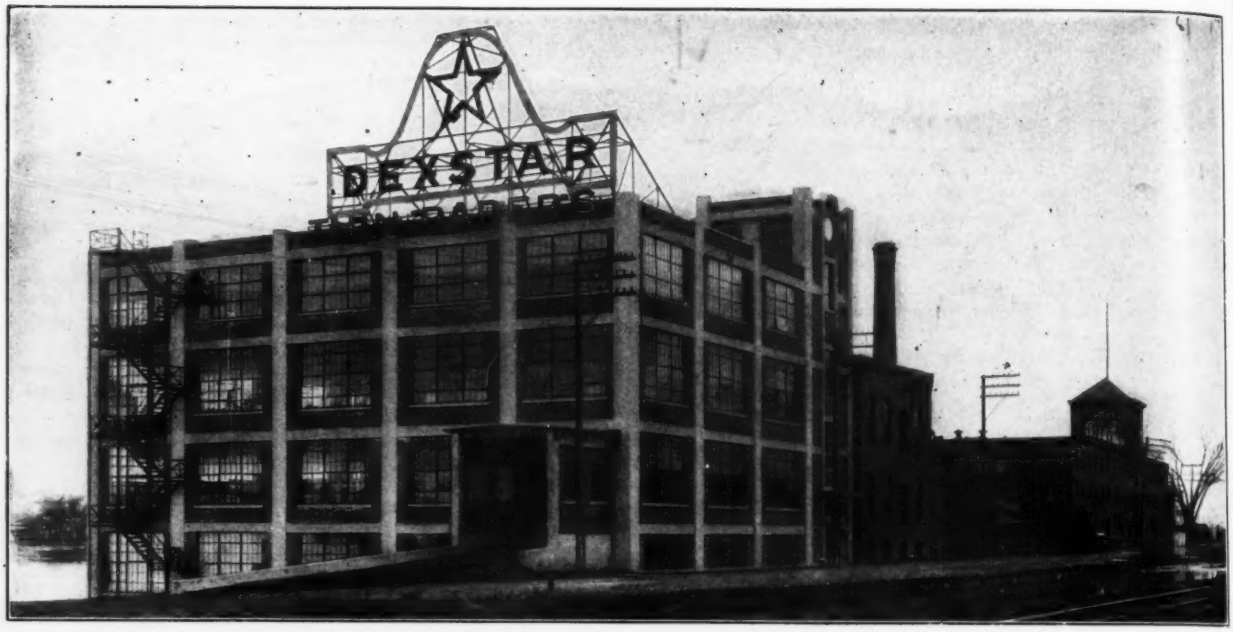

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GET PATENT ON STRAW PAPER

Edward B. Weston and William G. Clark have been granted a patent for a new process of making straw paper especially adapted for corrugating use in shipping containers, which patent has been assigned to the Weston Paper and Manufacturing Company of Dayton, Ohio.

This improved method of making straw paper produces an exceptionally hard sheet without sacrificing the flexibility and resiliency necessary for corrugating for which straw is peculiarly well adapted.

It is stated that this new method will result in vastly increased consumption of straw and that the Weston Paper and Manufacturing Company has plans on foot which contemplate a greatly increased production.

The Dayton Company has been manufacturing straw paper for use in corrugated paper packing boxes for forty-five years and has been in production of the super-rigid corrugating paper for the past several months while the patent has been pending.

The new product withstands rough usage and protects the contents of the package much better than the old product, it is stated by the company officials.

Baled straw, purchased from farmers, is the main constituent of the special paper made by the Weston Company. More than 100,000 tons of straw are purchased each year by the company from growers in Ohio, Indiana, Illinois and Michigan. With additional output of the finished product, the purchase of raw material will be greatly augmented.

Corrugated shipping boxes are now used generally for sending various breakable articles by freight, the transportation rate being the same as wooden boxes.

The Weston Paper and Manufacturing Company, with general offices in Dayton, and mills in St. Mary's, Ohio, Terre Haute, Ind., and other places, markets the product under the registered name "Red Stripe" by which the material may be readily identified.

The officers of the company are Edward B. Weston, president; W. B. Turner, vice-president; C. M. McGlaughlin, secretary and H. N. Wiles, treasurer.

QUAKING ASPEN FOR PAPER PULP

Technical Bulletin 155-T, "Quaking Aspen; A Study in Applied Forest Pathology," by E. P. Meinecke, just published by the U. S. Department of Agriculture, deals with fungous rots, cankers, and other conditions which result in deterioration of quaking aspen timber in Utah, most of which is owned by the Government. At present the aspen is almost a weed tree, though it has prospective value for pulping. The author's study was designed to provide the scientific basis for a management program and felling schedule if it seems desirable to retain the forested areas in aspen. The alternative appears to be a rather difficult and expensive process of replacing the aspen with trees which will have higher value for saw timber. The aspen is a relatively short lived tree and Dr. Meinecke discusses the relative rates of growth increment and decay increment which would enter into determination of an economic logging program.

Technical Bulletin 155-T may be obtained free while the limited supply lasts by applying to the Office of Information, U. S. Department of Agriculture, Washington, D. C.

K. V. P. HAS GOOD YEAR

The year 1929 was the best for the Kalamazoo Vegetable Parchment Company of Kalamazoo, Mich., since the close of the World War. That fact was brought out at the annual meeting of stockholders. The outlook for 1930 is equally favorable.

The new parchmentizing division, erected by the O. F. Miller Company, all steel, brick and concrete, is a model of its kind. It is equipped with four high speed parchmentizing machines, increasing the possible output in that unit fully 100 percent. During the past half dozen years K. V. P. has expended over $5,000,000 in betterments and the plant today is generally reputed to be the finest of its kind in the world. Great savings have been effected through improvements made.

All directors and officers were re-elected as follows: Directors, C. H. Stearns, C. S. Campbell, A. B. Connable, W. O. Jones, W. E. Kidder, Jacob Kindleberger, W. J. Lawrence, A. B. Read and Frank Mosteller; president, Jacob Kindleberger; vice presidents, C. H. Stearns, James W. Greenlee, Alfred Southon; secretary, Thomas W. Peck; treasurer, C. S. Campbell; general manager, R. H. Hayward.

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Inspection and Insurance of Pressure Vessels in the Paper Industry*

By William D. Halsey[1]

It will be the author's purpose in this paper to point out certain disastrous accidents that have occurred in connection with digesters and other pressure vessels used in the paper and pulp industry; to indicate what conclusions were reached as the result of the investigation of the cause of these accidents; and the precautions to be taken, as recommended by the insurance inspector, to avoid repetition of such accidents.

The sulphite digester is of considerable concern to the insurance inspector because of the fact that the sulphite liquor has a corrosive action on steel. Although sulphite digesters are, of course lined in some way, imperfection or leaks in the lining permit the liquor to reach the steel shell, and thus do considerable damage. When two such leaks occur, one above the other, there is the possibility of liquor circulating through the two openings, between the lining and the steel shell, thus causing a grooving in the shell which can readily go to dangerously extensive proportions before discovered.

It is impossible to detect from the inside the extent to which such action may have occurred and the only positive way to be certain that no damage has taken place is by making an examination of the shell with the lining removed. It is for this reason that the insurance inspector is particularly anxious to be notified when a lining is to be renewed so that he may have an opportunity to make a thorough inspection of the condition of the steel shell.

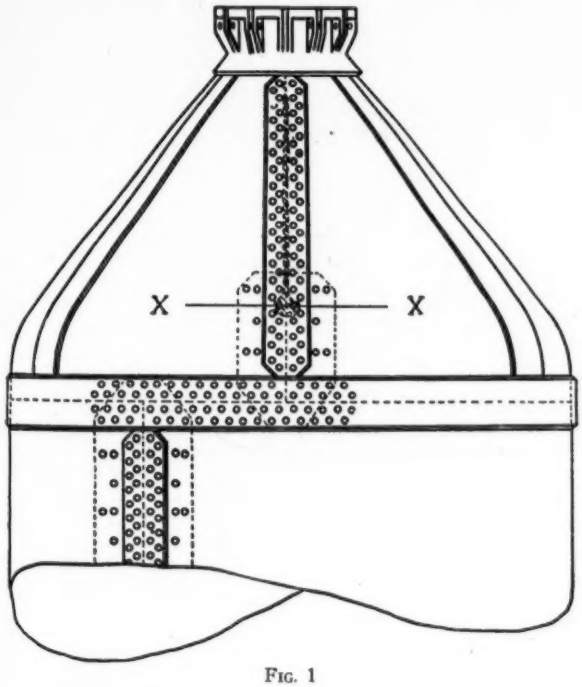

FIG. 1

One case of this kind of trouble will be pointed out because of the interesting way in which it developed. Fig. 1 shows the upper part of the digester, and it appears that a small defect developed in the lining just opposite the center line of the butt strap joint, and at the height indicated by the line XX. Fig. 2 shows the cross section at this point. The liquor penetrated the digester brick lining and the cement backing until it reached the inner butt strap. At this point some deterioration, although not extensive in area, occurred, but involved in this deterioration was one of the rivets. The liquor following through this rivet and eating out the metal

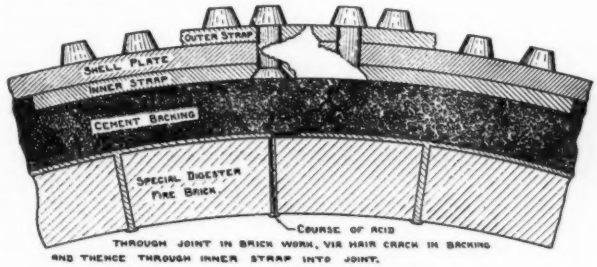
OUTER STRAP
SHELL PLATE
INNER STRAP
CEMENT BACKING
SPECIAL DIGESTER FIRE BRICK
COURSE OF ACID
THROUGH JOINT IN BRICK WORK, VIA HAIR CRACK IN BACKING AND THENCE THROUGH INNER STRAP INTO JOINT.

FIG. 2

Approximate section at X-X showing the manner in which corrosion took place.

between the rivet hole and the edge of the shell plate at the joint, soon reached the open space between the shell plates at the joint, Here of course there was a channel possibly ⅛ inch x 1⅛ inch, running the whole length of the joint and covered on both sides by the butt strap. However, this gave the liquor opportunity to corrode the outer strap, and when discovered a channel had been cut in the outer strap so that for a considerable distance it was only ⅛ inch in thickness.

A disastrous explosion did not occur in this case owing solely to the fact that the defect occurred about 4 feet from the upper girth seam so that the cone top was still supported by the girth seam. However, had this leak occurred at one of the butt straps in the lining in the cylindrical shell of the digester, the corrosive action might easily have extended over the entire length of the course with resulting weakening of the structure which would without doubt have resulted in an explosion.

Visual inspection of the inside of the steel shell of the digester with the lining removed is of course most conclusive as indicating whether or not any corrosion has taken place. However, where such inspections cannot be made at frequent intervals, it is recommended that ¼ inch test holes be drilled through the steel shell of the digester at intervals of about 12 inches vertically and horizontally, the holes being staggered in a vertical direction. If leakage occurs, it is almost certain to appear through one of these test holes before extensive damage has been done to the plates. It is well appreciated that the work of drilling such holes is great, but it is believed that the measure of safety gained fully justifies such work.

On new digesters being built, the drilling of these holes is not such an expensive item and it is well to specify that the test holes be made larger, say ½ inch, and drilled at intervals of 6 inches. When such holes are drilled in sulphite digesters, they should be kept clean so that leakage will appear through them and furthermore, the external surface of the digesters should be kept clean and painted a light color to aid in detecting leaks.

Single Butt Strap Construction

Some digesters have been built with single outside straps and this form of construction was involved in a notable accident which

* Presented at annual meeting of TAPPI, Pennsylvania Hotel, New York, N. Y., Feb. 20, 1930.

[1] Steam Boiler Inspection and Insurance Co., Hartford, Conn.

took place some years ago, and with which a number of you are undoubtedly familiar.

With the single butt strap construction, the stress is transferred across the joint from the plane of the shell plate to the plane of the butt strap and back again to the plane of the shell plate on the other side of the joint. Such stressing of the joint causes a bending of the strap and the shell plate which stress is concentrated along the outer row of rivets in the shell plate and the inner row of rivets in the butt strap. In addition to the pressure, the temperature also has some effect on the stress which is set up. The repeated bending of this nature over a long period of time resulted, in the case in question, in a crack developing in both the circumferential seam strap and the longitudinal seam strap and a disastrous explosion took place resulting in a property loss of $80,000, and in the accident two employes were killed and two were injured. That there was not a greater casualty list was probably due to the fact that the accident occurred on a Sunday evening when the number of persons in the mill was at a minimum.

It has been the experience of the insurance inspector that whenever the butt straps on the single butt strap construction have been removed the straps and sometimes the plate have been found cracked. Digesters of this construction therefore require careful watching in this regard and in the interest of safety a reduction in pressure is advisable on such digesters reaching an appreciable age unless the straps are removed to make certain that no cracks or defects exist.

Where cover plates on digesters are secured by bolts, as they usually are, a danger exists in the method by which these bolts are tightened by the operator. It is the tendency for the operator to tighten a bolt at some one point, and continue around the head tightening the bolts in sequence. Such procedure however can very easily result in over-stressing the bolts, because of the lever action which results between the cover plate and the gasket, when the bolts on the opposite side are tightened. The proper procedure is to bring all nuts snug without making them tight and then go from one nut across the diameter of the head to the opposite nut and then work on the two nuts on the diameter at right angles with those just tightened. After this the other nuts may be tightened in about the same procedure. The operator should be warned particularly not to make up any one nut fully tight before the others.

When referring to digester difficulties and defects the writer will not attempt to discuss those things which are more commonplace such as the proper selection of steel, proper methods to be used in the shop for the manufacture of the digesters or other items of this nature which although affecting the life of a pressure vessel are at the same time items generally common to all pressure vessels. It will be the intention more to discuss those points which relate to some of the peculiarities of digesters as found by the insurance inspector.

Sulphite liquor is known by all to corrode steel, and consequently no one is surprised when it is found that wastage of the plate has taken place where the liquor has come in contact with it. To protect the steel, the digester is lined. In the case of the sulphate digester however, no lining is used as it has been considered that the liquor used was not corrosive.

Corrosion in Sulphate Digesters

That considerable wastage of the plates does take place in sulphate digesters was brought very forcibly to the attention of the insurance companies a few years ago, when a digester used in this process exploded, killing three persons, injuring four others and causing a property loss of $150,000.

As is usual with digesters used in this process, the vessel was of forge welded construction, the plates being originally of ½ inch thickness. The digester which failed separated into four parts and the ruptures appeared to follow the welds to a considerable extent. Measurements of the plates following the accident indicated that wasting had taken place until the thickness of the metal had been reduced to a thickness of 5/16 inch in some places. The indications were that in the lower girth seams and for about 1/3 of the distance around the vessel, little of the metal had been actually joined in the weld, and at this point the joints slipped apart with very little tearing. The only portions of the joint that appeared to have been thoroughly welded were at the edges of the scarf of the weld. Furthermore, in certain portions of the joint there was a polished appearance as if a small amount of rubbing had been taking place there for a considerable period of time. The wasting away of the interior of the digester removed part of the metal from the sound portion of the joint and thus seriously weakened it.

It is to be noted that the interior surface of this digester was such that no one would suspect that any wasting had taken place.

Following this accident an investigation was made of a number of digesters used in the sulphate pulp industry and located in various parts of the country. This investigation of the thickness of such digesters after they had been in service for a period of years was made by drilling and at that time a record of the thickness of 66 digesters was obtained. The age of these digesters varied from one year to thirty-five years and wasting was found in every one, the reduction in thickness varying up to 68 per cent

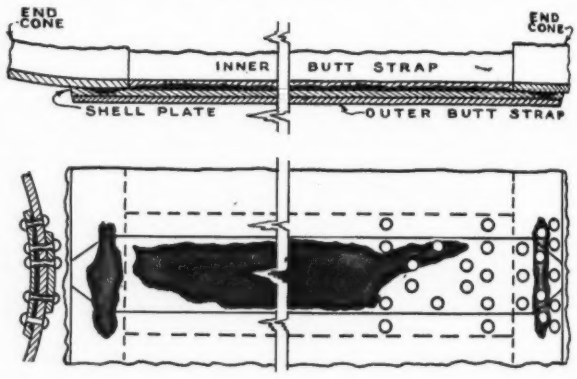

FIG. 3

The above longitudinal section and plan view of a portion of a rotary digester indicate, in the heavily shaded areas, where hidden wastage took place. The digester was of the rotary type, 9 ft. 6 in. diameter, 28 ft. long, constructed of 1¼ in. plate, inner butt straps 1 in. thick, outer butt straps ⅞ in. thick, and rivets 1⅛ in. diameter. The rivets were found reduced to ⅞ in. diameter and the plate and straps to a thickness of 11/16 in. to 13/16 in.

of the original thickness. In some few instances the wasting had not been so severe as to require any immediate action, but in a large number of cases it was necessary to greatly reduce the pressure. In some instances the pressure reduction meant a virtual condemning of the vessels so that they had to be replaced.

In the majority of cases it was found that the most serious wasting took place in the upper third or quarter of the digester, but that was not always so since there were some instances where the shell was wasted more near the bottom than at the top.

It has been felt that the wasting is due partly to a chemical action and partly to a mechanical action or erosion on account of the chips being in a state of agitation in the digesters. Some thought was given to the possibility of chemical action taking place by reason of the liberation of carbon dioxide in the sulphate process. However, wastage was also found in the straight soda digesters where it is understood no liberation of carbon dioxide takes place.

The action of sodium hydroxide on steel has been the subject of study by a number of investigators and it has been shown that as the concentration of sodium hydroxide is increased the potential of the iron or its tendency to enter a solution is at first very markedly decreased but with increasing concentration of sodium hydroxide, the electrolytic potential increases and even passes beyond the potential in a neutral solution. Whether or not this has any bearing on the question of wasting in soda or sulphate diges-

ters the writer is not prepared to say. It is believed that the question is one worthy of further investigation.

A very interesting case of wastage in a sulphate digester plant was discovered during the past year. The digesters in question were of the rotary type and of riveted construction. The inspector on making a regular internal inspection noted that some welding had been done on the inside head of some countersunk rivets in the butt strap seam. He had noted at the time of inspections during the preceding year that the outer edge of some of the butt straps had a hollow sound when struck with his hammer. The inspector requested the superintendent of the plant to advise him if any leakage occurred, and shortly thereafter the superintendent informed the inspector that leakage had developed at one of the rivets. Upon visiting the plant the inspector found the leaky rivet

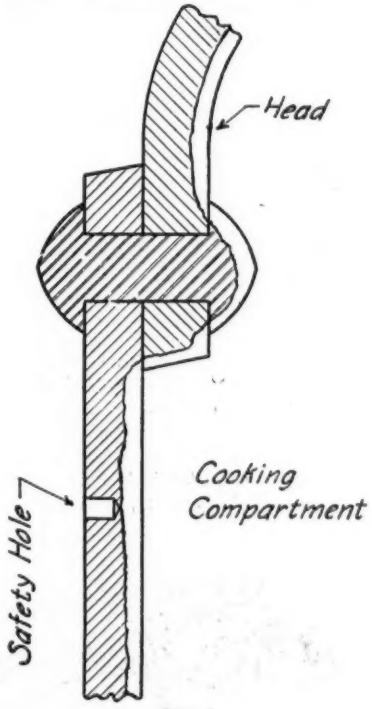

FIG. 4

was loose. He had it removed and found the diameter of the shank of the rivet was in places less than one half the original diameter. Other rivets were removed and found defective in the same manner. Arrangements were made to cut away a piece of the inside butt strap and the thickness of this strap was found to be reduced from 1 inch to 7/16 inch. Other seams in the digester were affected in the same manner and the shell plate was also found wasted away but to a less extent. Fig 3 shows the condition found. Following this, other digesters were examined and one of them was found in practically the same condition as the first one discovered and a third digester was also badly affected. These digesters were all discontinued from service and taken out of use.

The interest of the insurance inspector with regard to sulphate digesters is not what solution should be used, but what steps can be taken to detect possible weakening of the vessel with the solution that must be used. The problem is somewhat different than where it is desired to detect whether any leakage has taken place through the brick lining. In the sulphate digester it is desired to know when wastage has extended to such a degree as to weaken the structure. This wastage has appeared to be fairly uniform around the digester but it varies from top to bottom. The recommendation that the insurance inspector makes is that sulphate digesters be drilled from the outside to a depth that will represent a reasonable minimum thickness for safety. (see Fig. 4) When the metal becomes wasted away to an extent that the bottom of the holes would communicate with the interior of the vessel, leakage would occur and call attention to the fact that undue wear had taken place. Such holes need not be over 3/16 inch in diameter and if drilled on 24 inch centers or even 12 inch centers could not weaken the structure to any appreciable degree. Furthermore, since these holes do not pass entirely through the shell no leakage can take place.

Digesters are, of course, frequently provided with an exterior insulating covering and in such case the value of the test holes should be maintained by providing short lengths of copper or brass tubing which may be driven into the test hole and extend through the covering.

The drilling of such tell tale holes is strongly urged upon all users of sulphate and soda digesters and where new digesters are being built in the shops very little expense is added by having the holes drilled at the time of manufacture. In any event the expense of having such holes drilled is a minor matter when considering the question of safety to life and property.

Paper Machine Drying Cylinders

In a paper mill there are potential possibilities for a disastrous explosion ever present in the paper machine drying rolls. Only a few years ago such an accident occurred causing the death of two men and injuring eight others, the property loss being estimated at $100,000.

In order to properly drain a drying roll of this nature, it is necessary to have some kind of piping or arrangement within the roll. These devices, if kept in operation, ordinarily are satisfactory and accomplish the purpose while the roll is in operation. There is always, of course, the possibility that they may become deranged, permitting the roll to accumulate water. It frequently occurs that a valve on the steam line may leak somewhat so that during a period of idleness, steam leaks into the roll and condenses there. The draining devices generally will not remove such water of condensation while the roll is standing idle and should the steam pressure be turned on to the full extent with an appreciable amount of water in the roll a water hammer is certain to be set up and such water hammer action will rupture a construction which otherwise would sustain a fairly high pressure.

To obviate the possibility of water accumulating in this way, the steam line should be arranged with two valves and a drain connection between on which, of course, there should be a valve. When shutting down the paper machine for any period of time the two valves in the line should be closed and the valve on the drain line opened. Then, if there is any leakage of steam it will be shown in the drain line and steps can be taken to correct the conditions, while at the same time there will be no possibility of steam entering the rolls during the idle period.

Paper machine rolls may also be ruptured by too high a steam pressure. Where live steam is used to supply the rolls, it is customary to feed it through a regulating or reducing valve. However, it should be borne in mind that regulating valves will not always close tight and may easily become deranged. The insurance inspector therefore requires that a safety valve be placed on the steam line between the regulating valve and the rolls, the setting of this safety valve to be the maximum pressure allowed on the roll. With this arrangement, if the reducing valve fails to function properly the safety valve will prevent an undue accumulation of pressure which might cause an explosion.

Compressed Air Tanks

Air reservoirs or tanks used in paper mills of course differ in no outstanding way from air tanks used in other industries. However, violent explosions of air tanks have occurred and the proper precaution should be taken to avoid accidents with such vessels.

There is practically always some moisture present in compressed air which moisture accumulates in the reservoir and causes deter-

ioration from corrosion. Air tanks should be arranged so that they may be completely drained and attention should be given to this draining at frequent intervals. Where air tanks are placed vertically and where one head is concave to the pressure and the other convex to the pressure, the head concave to the pressure should be placed at the bottom so that complete drainage can be secured. Placing the tank with the head convex to the pressure at the bottom makes it practically impossible to completely drain it and corrosion is certain to develop around the flange of such a head.

The most disastrous explosions of air tanks have undoubtedly been those which have resulted from the ignition of a combustible mixture within the tank. It will be clear that the lubricating oil fed to the compressor cylinder will in some degree pass on to the air reservoir. This oil in the air compressor is subjected to considerable heat, and breaking down of the oil into some more highly explosive form may possibly occur under the action of such heat. Numerous theories have been advanced as to the nature of such accumulations, and while it is not definitely known just what the composition of them is, it is certain that they do originate in the oil. The proper precaution to be taken is that a high quality oil especially intended for air compressors be used and that the minimum possible amount be fed. In addition to this the system should be washed out from time to time with a caustic solution to remove all traces of oil.

The insurance inspector in visiting a plant views conditions from a particular standpoint—safety. He is not especially concerned with the process used in any particular instance, but he is vitally interested in how that process may affect safety of life, limb and property. With that viewpoint in mind he frequently does see and can point out hazards which may not have appeared to others who live with the equipment day in and day out.

Strength Testing of Wood Pulp*

Proposal for Section V (the Beater Method) of the Proposed Official Standard Method for the Evaluation of Pulp, Prepared by the Committee on Physical Standards for Pulp of the Technical Association of the Pulp and Paper Industry

By H. A. Rothchild[1], Ivar Lundbeck[2] and D. E. Cable[3]

I. Purpose of the Beater Method of Testing Pulp for Strength

The following detailed set of specifications for both equipment and the manner of processing pulp by means of a small beater with controlled bed plate constitutes one division of a comprehensive method or group of methods which it is hoped will eventually be formulated and adopted by the Technical Association of the Pulp and Paper Industry, and the Technical Section of the Canadian Pulp and Paper Association, being designed to test a given wood pulp or half stuff by physical means so as to enable one to judge how strong a paper may be made from that material when processed in one way or another with or without hydration of the individual fibers.

In this division of the test, a specially designed laboratory beater is used to study the ability of pulp to respond to a physical treatment similar to that encountered in commercial beaters. The behavior of our pulp in this small beater processing operation is judged or measured by the magnitude of strength qualities (such as bursting, tensile or tearing strength and folding endurance) observed in handmade paper prepared in a standard way from the pulp so treated. It is believed that this division of the general test should be particularly helpful in determining the relative merits of a pulp which is to be used in a mill where the beating operation constitutes a more or less important phase of paper making.

This beater division of the general pulp strength testing procedure embraces no other operation than the furnish and operation of the beater, since sampling and making of sheets as well as the physical testing of them are assumed to be identical with the corresponding operations under the initial strength or the pebble mill test methods.

II. Apparatus

(a) Beater, With Controlled Bed Plate (Fig. 1). The standard piece of equipment to be recommended for the beater method of hydration is a so-called 1½ pound beater of the Niagara type. Fig. 1 shows a picture of this machine.

Fig. 2 is a dimensional drawing of it. The bed plate and roll are to be made of bronze. The roll is to have 32 fly bars, each being ⅛ inch thick and approximately ½ inch deep. The bed plate and lever arms shall be of such weights as to be in perfect balance with a small weight applied to the weight spindle at the end of the extension arm. The bed plate shall have 7 bars, each 3/32 inch thick and spaced 7/32 inch apart on centers. These bars are to be of a single angle type, having an angle of 45

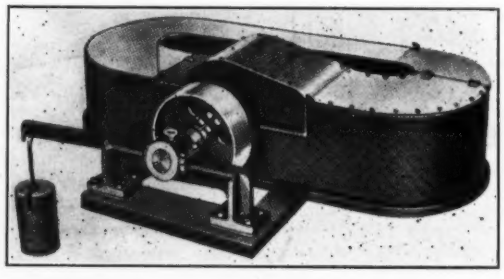

Fig. 1
Niagara Type Experimental Beater.

degrees with the apex of the "V" pointing in the direction of movement of stock over the plate. The grooves between the bed plate bars shall be filled with strips of hardwood such as maple.

(b) Sampling Cup. A copper sampling cup shall be provided, having such a size as to remove the required amount of stock at 2.5 per cent air dry consistency for the making of a sheet of standard area and basis weight, when filled flush with the top. This cup should be approximately of a height equal to its diameter.

III. Test Specimen

The quantity of pulp required for a beater test is 450 grams of oven dry fiber or its equivalent. All precautions must be taken to assure one that the sample placed in the beater is accurately representative of the original lot or shipment to be tested. It is recommended that one use the discs from the official pulp moisture test not used in that test. Any air drying or oven drying of the sample prior to the test is to be avoided.

In order to know precisely the gross weight of damp or wet

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[3]Member TAPPI, asst. director of research, Oxford Paper Co., Rumford, Maine.

pulp to be taken for a charge, it is imperative that a preliminary moisture test of the pulp be made. The observed moisture value should not only be known to determine this gross weight, but it should be noted as one of the significant factors in recording data for the beater test itself.

IV. Procedure

FURNISH OF THE BEATER: The beater should be furnished with the charge of pulp above mentioned and such a quantity of water (20 liters, including any accompanying the pulp sample) as to give a 2.5 per cent. air dry consistency. The pulp should be torn up and kneaded by hand in a pail with but part of the water to be added. The temperature of the stuff in the beater after all water has been added should be 25 deg. C (77 deg. F. with a tolerance of ±1 deg. C. (The water added to the pulp in the pail or later

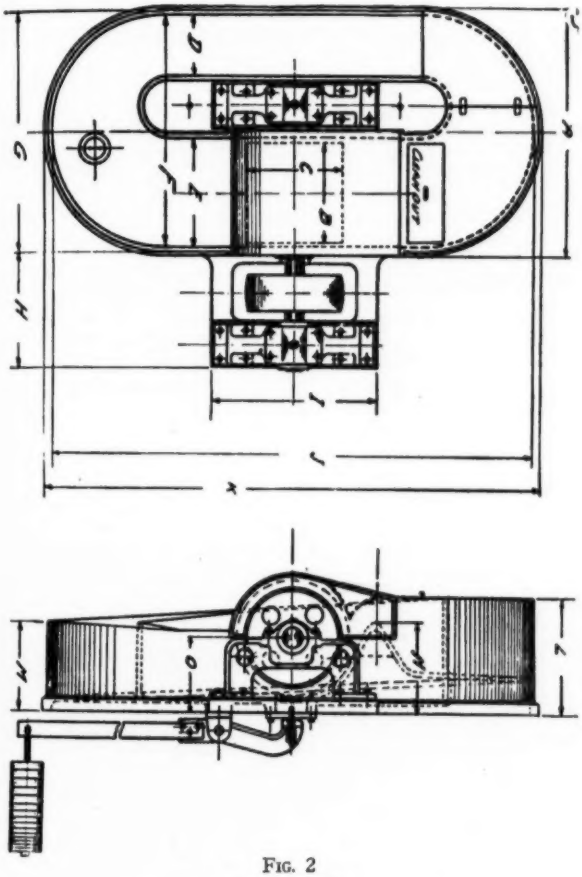

FIG. 2

Dimension Table
Laboratory Beaters, Niagara Type, Iron Tub

Size	A	B	C	D	E	F	G	H
1½ lb.	16"	6"	7⅝"	4"	6½"	14½"	15¼"	9⅛"
	I	J	K	L	M	N	O	
	15"	36"	37⅛"	8"	7⅛"	6½"	5⅛"	

All dimensions in inches. Dimensions as given herein are not to be used for construction purposes.

to the beater may be either cooled with ice in the summer or be preheated to 38-40 deg. C. to give a resultant temperature of 25 deg. C.).

In charging the beater bed plate should be down (with no weight on the bed plate lever) and the roll should be revolving at the standard speed of 500 revolutions per minute. Some of the 20 liters of water is added first. The kneaded pulp is transferred from the pail and finally the last fraction of water is poured into the beater. The freshly charged pulp is made to "travel" idly around the beater for 5 minutes with no weight on the lever arm.

SETTING THE BEDPLATE: Immediately after this short interval with a light brush action the bed plate is pushed firmly against the revolving roll by adding one of the following weights to the end of the lever, depending on the kind of pulp being tested:

4500 grams (for bleached sulphite)
5500 grams (for unbleached sulphite)
6500 grams (for kraft or other alkaline type of pulp)

These weights are in addition to small weight required to exactly counterbalance the bed plate and lever arms. The time intervals for the removal of samples during the beating operation are measured from the instant one of these weights is first applied.

THE TAKING OF SAMPLES: A set of five test sheets is to be made up after each of the following time intervals, by that number of dips of the copper cup, each cup load being placed in a beaker of its own:

a. First set five minutes after setting the bed plate

b. Second set twenty minutes after setting bed plates.

3. Additional sets with at least fifteen preferably ten minute intervals, until a decided drop in bursting strength is observed, i. e. until after the maximum strength has been developed.

A set of five test sheets should be prepared for each time interval, providing the size of trimmed sheet is not less in area 42 square inches and that three strength characteristics (such as bursting, tearing, and folding endurance) are to be measured each time. Should only two strength characteristics be sought only four sheets need be made each time and should but one such characteristic be of interest, three sheets only need be made. More or less sheets are to be made in each case directly in proportion to the extent by which the size of trimmed sheet is smaller or larger in area than the 42 square inches.

V. Reporting Results

The methods of preparing the test sheets, of conditioning them at 65 per cent relative humidity and of testing them for any or all of the following strength characteristics are to be, as mentioned above, identical with corresponding steps adopted as standard for the initial strength test and the pebble mill hydration test:

a. Mullen or bursting strength.

b. Tensile strength or breaking length

c. Elmendorf or tearing strength

d. Folding endurance.

The above testing procedure should be carried out in duplicate for each pulp in order to obtain results of unquestioned accuracy.

A beater test conducted with the making of two or more of the above four physical measurements on the resultant hand sheets in the manner above specified shall qualify as a *standard test of dependable accuracy*. This is not to be confused with a quick control method beater type of test that may be developed and proposed at a later date.

VI. Care of the Beater

It is very essential that the beater be kept in excellent condition For "grinding in" of bed plate and roll, just sprinkle a handful of fine abrasive in circulating stock and repeat the process by finishing off with a fresh charge of stock and the abrasive material of "dust" composition, and finally by means of a file or of emery cloth; slightly dull the sharp edges of the roll bars just enough to take off the feather edge, the major part of the surface being perfectly flat.

The lever arm should work freely, with the least possible friction so that practically no effort is needed to bring the bed plate in contact with the roll. Use elastic diaphragm material between bed plate and bed of beater so that the diaphragm will neither add nor subtract from the weight placed on the lever arm.

Note that no play or sideways movement exist in the beater roll bearings and that tilting of the bed plate does not take place.

Ferro Alloys in The Sulphite Mill*

By Andreas Christensen[1]

From the time of the introduction of the sulphite process to the present day, sulphite mill operators have been faced with the problems arising from the highly corrosive action of hot calcium and magnesium bisulphite cooking liquor. To handle sulphur dioxide gas and cooking acid at low temperatures is a comparatively simple matter. Lead fittings, properly installed, will give long service with very little attention.

When it comes to digester fittings and auxiliary equipment in connection with the digester operation, where the cooking liquor is handled at temperatures as high as 150 deg. C., we are faced with an entirely different problem.

Alloys containing a high percentage of copper, have been almost universally adopted by the mills for this use, and it is only in recent years that metallurgical research has brought about a change through the introduction of ferro alloys, whose corrosion resisting qualities are far superior to those of the copper alloys.

Most of these alloys were developed in the research departments of the Krupp Iron Works, in Germany, and the base patents are the property of the Chemical Foundation of America. Through an arrangement with this organization, ferro alloys are now manufactured by a number of American companies under various trade names and are produced in all the commercial forms required in a sulphite mill. The writer has had an opportunity to give two of these alloys a thorough working test over a period of two years, and the data submitted in this paper is based on results obtained in the mill rather than in laboratory experiments.

Alloys Tested in Mill Operation

The two alloys used were of the following composition:

Alloy No. 1 belongs to the high chrom iron group and will show an analysis something like the following: chromium 25-30 per cent, manganese 1.00 per cent, nickel 0.5 per cent, silicon 0.5 per cent, carbon, 0.25 per cent.

Alloy No. 2 belongs to the group that is often referred to as the "18-8" group, whose chemical specifications would be about as follows: chromium 17-20 per cent, nickel 7-10 per cent, manganese 0.5 per cent, silicon 0.5 per cent, carbon 0.15 per cent.

To give the metal a thorough test under the most severe working conditions, a 2-inch bronze body relief valve fitted with disc and seat made from Alloy No. 1, was installed on the head of a 15-ton digester.

After ten months of continuous service the valve body gave out and was replaced with a new one. The disc and seat which showed no sign of wear were transferred to the new valve. This valve lasted about nine months and again the disc and seat were transferred to another new valve where today, after about two years of continuous service, these parts show no sign of being attacked by the hot relief gas and liquor.

Tubing made from Alloy No. 2 was tested in a similar manner. A piece of standard weight with flanges of the same metal was placed in the relief line next to the same digester. This pipe has now been in use for fifteen months and gives no indication of wear. During this time it has handled all the relief from a digester with a capacity of fifteen tons per blow. The results obtained in these and various other tests made, were considered so satisfactory that during the past twelve months all small fittings about the digesters, the entire system of relief, test line, and gauge piping, as well as numerous other pipes and fittings, have been changed from copper and bronze to a ferro alloy.

Owing to the high cost of complete valves made from this metal, we have continued to use bronze valves in sizes larger than one inch. These valves are fitted with discs and seats and in some instances stems, made from the special alloy. There is some indication that the life of the bronze valve bodies are shortened by electrolytic action. To guard against this possibility we are changing over more and more to fittings made entirely from this metal, except where the cost is prohibitive.

The pipe used has been of standard weight and in sizes from ¼-inch to 3 inches. All connections have been made with either screw or flanged fittings of the same metal. All small fittings, as well as small valve parts, are manufactured from bar stock. Larger fittings and flanges are made from castings.

Applications of Ferro Alloys

The principal uses to which ferro alloys have been put in this mill are as follows: relief, gauge and test line piping; discs, seats, and stems in valves handling hot cooking acid and relief gas; digester plugs and strainers; digester cover liners; plug cocks for test and gauge lines; blow pit drainer bottoms; pump shafts; bolts in acid tanks and blow pits; pins in swing check valves. In addition to these, the alloy is finding its way into other departments of the mill where it is essential to use metals of high resistance to corrosion.

The machining of ferro alloys is in itself quite a problem and requires some study, but the difficulties met with can easily be overcome if we only keep in mind the extreme toughness of the metal and slow the various operations down to about one-third the speed used when handling bronze fittings.

It is very essential to keep the various machine tools sharp at all times; where the metal has been subjected to severe cold working, it is advisable to heat it to about 1750 deg. F. and cool it off rapidly to relieve the strains and put the metal back in its original state to withstand corrosion. In welding ferro alloys we have found that their corrosion resisting qualities are considerably reduced.

Relative Costs

The price of these alloys is higher than that of copper alloys, and when in addition the higher cost of machining is added, the initial cost of fittings made from this metal will average twice that of bronze. The maintenance cost per ton of pulp is the figure we are interested in. This is, however, impossible to determine until we know the ultimate life of this metal. Some fittings have been continuously exposed to hot calcium bisulphite liquor for over two years and show hardly any signs of corrosion.

Other items to be considered in figuring costs include better control of the digester operation by eliminating the possibility of losing gas through leaky valves, and the fact that strainers remain clean and need be inspected only when repairs are made to linings.

Perforated drainer bottoms, made from ferro alloys, for use in blow pits, come nearer to solving one of the most troublesome problems in the sulphite mill, both from the standpoint of waste and upkeep, than any other material introduced to date.

It is only in recent years that attempts have been made to recover the heat lost by cooling down relief gas and liquor, and to use it for preheating the cooking acid. Another improvement that would have a still greater bearing on the quality of the pulp made would be a circulating system for sulphite digesters that would be as fool-proof as similar systems used by kraft mills.

These special alloys will make it possible to carry out these improvements to the process of cooking sulphite where it has not been practical for the average mill to do so before their introduction.

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[1] Member TAPPI; Sulphite Superintendent, Rhinelander Paper Co., Rhinelander, Wis.

Outlook For Business and the Paper Industry *

By Dr. E. O. Merchant, Statistician, G. H. Mead Co., New York

Once again I have the pleasure of meeting with you to discuss the outlook for the pulp and paper industry for the new year. As I have stated on previous occasions, it is axiomatic that what is going to happen to the paper industry will depend in large measure on what is going to happen to general business. At the outset, therefore, we must examine the fundamental factors that will determine the course of general business during 1930. To repeat this close correlation between business and paper consumption seems hardly necessary, since it is so generally understood, but it is a curious fact, that every time we have a slump in business, there are always some in the paper industry who do the ostrich act and imagine that for special reasons the volume of advertising and the consumption of paper will still show a big increase. Suffice it to say that this miracle has never yet happened.

Comparison of 1929 and 1930

A year ago at this time we were approaching the finish of a long up-swing in business that began in December 1927 when Henry Ford started production on his new model. Production was heavy in all industries, labor was generally well employed at high wages, agricultural conditions were improving and the purchasing power of the general public was greater than ever before. In short, we were enjoying a period of exceptional prosperity. Today by contrast, we are just emerging from a severe business recession, production generally is subnormal, unemployment is large and the purchasing power of the factory and city populations, at least, is very much reduced. Fortunately, agricultural conditions are about as good as they were a year ago.

To bring out the contrast a little more clearly, a year ago we were climbing a fairly steep hill and were almost in sight of the top. We were absolutely certain that when we reached the top a few months later, we would have to go down the other side into the next valley, but we didn't know just how steep the descent would be or exactly how long it would take. According to most business indexes we were at the top of the rise where we could look down in the month of June. The descent the next three months of July, August and September was very gradual. Then unexpectedly we came to the jumping off place and before we knew what had happened, our feet went out from under us and we rolled down to the bottom. That's where we found ourselves a few weeks ago, but fortunately while getting badly bruised and battered from the fall, we did not have any bones broken and we found when we picked ourselves up and brushed off the dirt, that we were still able to limp.

At the end of December 1929, we were very much in the same position that we were at the end of November 1927, only a little more shaken up and bruised. Before us a little way ahead rises the upward slope of the next hill that we are presently going to climb. Between us and this slope is a stretch of terrain covered with foothills where the ascent is very gradual and irregular. In making a forecast on general business for 1930, the main problem as I see it is to estimate how much time it is going to take to cover this intervening space.

On previous occasions I have called attention to the fact, that the automobile industry in recent years has been the leader of the procession. The formula that "as goes this industry so goes general business," still holds good, due to the fact that the automobile industry buys such huge quantities of materials from numerous other industries and employs such a large army of workers, and also to the fact that periodically it goes through very rapid changes. Next in importance unquestionably is the building industry, but it is much more stable. Even in the worst years the volume of construction of all kinds is very large, whereas in the automobile industry periodically production almost ceases. In the whole month of December, 1929, for instance, less cars and trucks were produced than in a single week of April or May.

The automobile industry now has the largest sales volume of any industry in the United States. It employs something like 4,300,000 men and consumes a considerable percentage of the entire output of various other industries, such as, steel, rubber, plate glass, copper, lead, nickel, hardwood lumber, etc.

A fair estimate of domestic automobile production for the first half of 1930 is that it will be about 75 per cent of the output for the first half of 1929, or about 2,420,000 cars and trucks as compared with 3,225,000 units a year ago. This is a shrinkage of some 800,000 cars. For the second half-year production will be fairly close to that of 1929, any losses during the third quarter being offset by gains in the fourth quarter. The number of men employed and the purchases of raw materials will naturally fluctuate during the year in about the same way as production and in so doing will go far toward determining the course of general business.

The building industry has been showing a gradual downward trend since back in 1928, due to the overbuilt condition of many cities and the increasing scarcity of mortgage money. Despite all the ballyhoo that has been indulged in since the Washington conference called by President Hoover, the immediate outlook for the building industry is anything but promising and the ten billion dollar building program that has been predicted for 1930 is not likely to materialize. Mortgage money is still relatively scarce and will be for some months to come and many cities are still somewhat over-built. But it is probable that the increase in engineering projects and public works that has been stimulated by these conferences, will offset any further decline in residential and office buildings, leaving the total volume for 1930 about equal to that recorded for 1929, which was smaller than in any previous year since 1924. In other words, while the trend of new construction will change from a downward to an upward direction before many months, the recovery in its initial stages is not likely to be rapid or well sustained. The second half-year will be somewhat better than the first half.

The outlook for the automobile and building industries as presented above, together with the probability that the railroads will not order as much steel in 1930 as in 1929, can only mean that iron and steel production will fall considerably short of the 1929 record and that the consumption of copper, soft coal lumber and many other raw materials as well as the volume of freight hauled by the railroads, will be less this year than last, but that most loss will come in the first half year. Curtailment in the basic industries will naturally be reflected in weaker commodity prices.

Improved Money Situation

Among the favorable factors in the situation, the improved money conditions not only in this country but throughout the world should be mentioned as of the first importance. The speculative mania which was raging a year ago has subsided, brokers' loans have been liquidated and a small army of speculators have gone back to work. These radical readjustments have already brought a sharp decline in money rates in this country and Europe, but surplus funds are not yet as abundant as they should be due to the fact that the banks generally still have large

* Delivered at the convention of the Paper Industry, Pennsylvania Hotel, New York, Feb. 19, 1930.

amounts tied up in collateral loans that cannot be quickly liquidated. There must be a period of liquidation of these frozen loans and accumulation of new capital before money will really be easy and plentiful. Federal Reserve policy is clearly in the direction of easing the money market as shown by the recent reduction in the New York rediscount rate, following two previous reductions. The rate today is down to 4 per cent as compared with 6½ per cent a few months ago.

The high call money rates of the past year which attracted surplus funds from all over the world, caused serious dislocations and disturbances to industry and commerce in European and other countries. The recent sharp decline in money rates is making possible a return to normal in these countries, which in time will mean greater business activity and employment and a greater buying power for our exports. But it will take some time for these readjustments to be completed.

Another favorable factor is the agricultural situation. Taking both the yields and prices of the leading agricultural crops into consideration, it is probable that the buying power of the farm population remains nearly as strong this year as last and this is a real sustaining factor in the 1930 picture.

This brief survey might be extended to include many other factors of less importance, but when they are all analyzed and weighed in the balance, we come to the logical forecast that the worst of the recession is already over, that recovery during the first half year will probably be rather slow and halting, that a considerable slackening will occur during the summer months and that the recovery will become more rapid during the second half year, especially if the new crop condition are favorable. In other words, by September or October we will have traversed the intervening irregular terrain described above and started to climb the steeper slope of the next hill, and when we meet here again a year from now, I shall expect to find business humming much as it was a year ago.

With this forecast for general business established let us survey conditions in the pulp and paper industries, remembering that the consumption of paper will increase as business expands but with a lag of several months. Our forecast based on this correlation made a year ago, was approximately correct for the first half year, but a little too conservative for the second half year, due to the fact that business did not recede during the third quarter as rapidly as expected. The increase in consumption of approximately 5 per cent which we forecast for the first half year carried through the whole year despite the set-back in November and December and followed a similar increase in 1928. Due to special reasons the increase in consumption for the various grades varied considerably. In the case of newsprint, the increase was almost exactly 5 per cent. In the case of paper board it was probably double this figure. Book and tissue paper showed an increase of about 8 per cent, writing and cover an increase of about 6 per cent, while wrapping paper increased only 2 or 3 per cent and building papers showed a 10 per cent loss.

For the first half of 1930, the consumption of all grades of paper combined is likely to show some loss as compared with the first half of 1929. For the third quarter consumption should be about equal to that of a year ago, while for the fourth quarter it seems pretty certain that gains will be in evidence and in some cases they will probably be large enough to offset the losses of the first half year. In other words, taking the year 1930 as a whole, the total consumption of all grades of paper combined will not vary much from the 1929 figure of about 13 million tons. In the case of some grades, consumption may show a little increase and in other cases a small decrease. Newsprint and book paper consumption are more likely to show a small increase than a decrease. The only year since the end of the World War in which news print consumption has failed to show some increase was in 1921. Wrapping paper consumption and possibly box-board, on the other hand, are more likely to show a small decrease than an increase. Production, of course, will depend not only upon consumption but also upon imports and exports and changes in stocks. The production of newsprint in the United States is likely to increase in 1930 due to special reasons, whereas it decreased about 2 per cent in 1929.

Since mill capacity in practically all branches of the paper industry will show some increase in 1930 as a result of improvements and additions, the rate of operation for all grades of paper will be less in 1930 than in 1929. Instead of averaging around 79 per cent it may not average much over 75 or 76 per cent. Competition will therefore be keener and prices and profits generally lower. But it should be evident that compared with all previous years except 1929 the volume of business to be done by the paper mills in 1930 will be very large, plenty large enough in fact to yield good profits, if merchandising were more intelligently conducted and each mill had the good sense to manufacture only the grades and the quantity that could be sold at a profit.

Our forecast for the paper industry in 1930 means little or no increase in the consumption of chemical pulp, whereas mill capacity on the West coast and in the Scandinavian countries, especially in the case of bleached sulphite, will show a substantial increase. Already prices have broken sharply and we hear of quotations as low as $45 for kraft pulp and $70, for bleached sulphite f. o. b. docks.

These prices are so low that they are not likely to go much, if any lower, but they may not strengthen much in 1930.

In the case of mechanical pulp, weather conditions constitute a very important factor in determining market prices. Consumption will be about equal to that for 1929, but the supply may be curtailed by a prolonged period of dry weather or stimulated by a prolonged period of wet weather in the principal mill districts. Hence the weather factor will largely determine the price level, but the forecasting of weather conditions is a little out of my province. We will leave this to the Weather Bureau.

While the consumption of pulp and paper in 1929 showed a healthy increase, prices and profits were anything but satisfactory. In most cases the mills had little to show at the end of the year for the big volume of business done. One or two branches of the industry, which seemed to have learned the lesson of cooperation and intelligent merchandising made a very satisfactory showing. For the remainder it was just another year of demoralized conditions with little or nothing being done to remedy them. The most discouraging thing to consider as we try to look ahead into 1930, is the fact that thus far the paper industry has failed to develop any constructive leadership or united effort to bring order out of chaos. Considerable sections of the industry are still drifting more or less aimlessly about.

The newsprint branch of the industry can hardly be said to have made much headway during the past year. The paperboard industries, if anything, have lost ground and are worse off than they were a year ago. The book paper industry is as disorganized as ever. The efforts made by the kraft and sulphite wrapping paper branches of the industry canot be said as yet to have succeeded, although these groups are entitled to the credit of having tried to solve their problems. Apparently the writing and cover group is about the only one that has shown real progress.

To sum up the situation, the paper industry stands today just about where it stood a year ago. Only a comparatively few concerns have successfully solved their distribution problems. A fundamental difficulty is that most mills are dominated by production-minded instead of sales-minded executives. As a result production continues to be in excess of market requirements and selling below cost is widely prevalent, notwithstanding all the efforts your Cost Association and the Salesman's Association have made to teach better methods.

Those Who Attended the Convention

Official Registration of the American Paper and Pulp Association

A

Aal, B. S., Saranac Pulp & Paper Co.
Abrams, Allan, Marathon Paper Mills Co.
Acree, S. F., Bureau of Standards, Washington, D. C.
Ahart, John B., U. S. Envelope Co.
Alden, C. W., Oxford Paper Co.
Alexander, L. M., Nekoosa-Edwards Paper Co.
Allison, R. L., U. S. Envelope Co.
Amy, Frank H., Lowe Paper Co.
Anderson, Ossian, Puget Sound Pulp & Timber Co.
Anderson, W. H., Westinghouse Electric & Mfg. Co.
Andrew, C. K., Blandin Paper Co.
Andrews, F. R., Esleeck Mfg. Co.
Archibald, A. J., Nekoosa-Edwards Paper Co.
Archibald, C. K., Blandin Paper Co.
Artz, W. H., Westinghouse Electric & Mfg. Co.
Astley, A. W., Chemical Paper Mfg. Co.
Atwater, J. R., Mead Pulp & Paper Co.
Atwood, B. T., Atwood & Morrill.
Austin, D. A., Hammermill Paper Co.
Austin, Edward H., Bulkley, Dunton Co., New York.

B

Bache, E., Bogalusa Paper Co.
Bacon, C. B., Write, Inc., New York.
Bagg, J. L., Millers Falls Paper Co.
Bailey, D. P., Flintkote Co.
Baird, P. K., Forest Products Laboratory, Madison, Wis.
Baker, C. M., Engineer, American Paper & Pulp Association.
Baker, R. R., Westinghouse Electric & Mfg. Co.
Baker, R. S., Ottawa, Can.
Baker, W. E. B., Stein-Hall Co., New York.
Baker, W. N., International Paper Co.
Baldwin, F. J., Munising Paper Co.
Baldwin, H. R., Hammermill Paper Co.
Bardeen, Norman, Lee Paper Co.
Barker, H. T., Bird & Son, Inc.
Barruss, J. T., Albemarle Paper Mfg. Co.
Barteis, E. F., Munising Paper Co.
Bearce, E. F., Chillicothe Paper Co.
Bechard, E. N., Eastwood Wire Corp.
Becker, Folke, Rhinelander Paper Co.
Beckett, Guy H., Beckett Paper Co.
Beebe, Clarence, Wire & Wire Products.
Behre, C. E., Northeastern Forest Experiment Station.
Bell, R. W., U. S. Department of Agriculture.
Bellows, John, Parker-Young Co.
Benson, E. H., Regal Paper Co.
Benson, D. W., Regal Paper Co.
Benson, H. K., University of Washington.
Benton, J. M., Bedford Pulp & Paper Co.
Bentzen, T. C., Whiting-Plover Paper Co.
Berger, O. L., G. D. Jenssen Co.
Bergholtz, American Telephone & Telegraph Co.
Bergstresser, Louis Dejonge & Co.
Beveridge, F. N., Hopewell, Va.
Beveridge, J. B., Bonaventure Pulp & Paper Co.
Bhagwat, M. R., Combustion Utilities Corp.
Billings, E. J., Fuller Lehigh Co.
Bing, H. O., Paper & Textile Machinery Co.
Birt, H. R., Byron Weston Co.
Bittner, L., Central Paper Co.
Black, C. F., Fulton Engineering Co.
Blanchard, Gordon, Crocker-McElwain Co.
Blodgett, Chas. A., Eastern Mfg. Co.
Blosser, J. B., International Paper Co.
Boehm, Robert M., Masonite Corp.
Booth, J. M., Huron Milling Co.
Booth, L. M., Booth-Chase Co.
Borchardt, A. H., Worthington Pump & Machinery Corp.
Bostwick, R. F., Victoria Paper Mills.
Bosworth, R. L., Chemical Paper Mfg. Co.
Bowan, T. C., Rising Paper Co.
Bowen, W. R., Fuller Lehigh Co.
Bowman, Paul, West Virginia Pulp & Paper Co.
Bradley, P. D., Fort Howard Paper Co.
Brakewood, H. E., Ohio Boxboard Co.
Bray, Mark W., Forest Products Laboratory, Madison, Wis.
Bray, Paul, University of Maine.
Brazeau, G. S., Appleton Machine Works.
Brophy, F. E., International Paper Co.
Brooks, A. M., Rafford Co. of America.
Brooks, C. J., Starch Products Co.
Brown, D. K., Neenah Paper Co.
Brown, E. E., Lawrence Bag Co.
Brown, H. H., 475 Fifth Ave., New York.
Brown, Spencer, Rhinelander Paper Co.
Brown, W. E., Pejepscot Paper Co.
Brower, F. L., Groveton Paper Co.
Brust, W. T., Hammermill Paper Co.
Bryan, C. M., Strathmore Paper Co.
Bryant, K. E., Fuller Lehigh Co.
Buhrer, Russell A., Union Waxed & Tissue Paper Co.
Bullard, J., Finch, Pruyn & Co.
Bullis, E. G., Groveton Paper Co.
Bullock, Warren B., Import Committee.
Bunge, Alfred, 33 W. 42nd Street, New York.
Burgen, J. H., Rag Content Manufacturers Association.
Burke, Sec., Cost Association of the Paper Industry.
Burkhardt, F. T., Keith Paper Co.
Burns, Kendrick, S. D. Warren Co.
Bush, Seth L., Crocker-McElwain Co.
Buskirk, C. A., Michigan Paper Co.
Buxton, W. H., Philadelphia Quartz Co.
Byron, Stanley, Hammermill Paper Co.

C

Cable, D. E., Oxford Paper Co., New York.
Callighan, O. W., Edgar Bros. Co.
Cameron, E. P., Forest Products Laboratory of Canada.
Cameron, James, Cameron Machine Co., Brooklyn, N. Y.
Campbell, Dr. John, International Paper Co.
Campbell, W. B., Forest Products Laboratory of Canada.
Cantine, Holley R., Martin Cantine Co.
Cape, T. A., Continental-Diamond Fibre Co.
Carr, P. W., National Aniline & Chemical Co.
Carr, R. W., Armstrong Cork Co.
Carruth, H. P., Mead Pulp & Paper Co.
Carson, F. T., Bureau of Standards, Washington, D. C.
Carson, Robert M., Fort Howard Paper Co.
Carter, George H., Government Printing Office.
Chadwick, Philip S., Chapin & Gould paper Co.
Chalon, O. T., General Dyestuff Corp.
Champion, C. H., Price & Pierce, Ltd.
Chapin, R. F., Millers Falls Paper Co.
Chapin, R. I., American Writing Paper Co.
Chappell, F. L., Sheffield By-Products Co.
Charles, J. L., E. Z. Opener Bag Co.
Charron, R. C., U. S. Envelope Co.
Chase, H. A., Brown Co.
Cheney, Richard, John A. Manning Paper Co.
Chilson, W. A., Marathon Paper Mills Co.
Christiansen, C. J., Fibre Making Processes.
Christensen, Rhinelander Paper Co.
Churchill, H. L., Finch, Pruyn & Co.
Claflin, L. L., Erving Paper Mills.
Clark, C. B., Riverside Paper Corp.
Clark, F. C., South Manchester, Conn.
Clark, K., American Seal Kap Co.
Clark, Norman, Standard Paper Mfg. Co.
Clarke, E. W., Knowlton Bros., Inc.
Clarke, James P., McDowell Paper Co.
Cline, Max, International Paper Co.
Cobb, R. M., Miss, Lowe Paper Co., Ridgefield, N. J.
Coffin, Dexter D., C. H. Dexter & Sons, Inc.
Coggshall, G. W., S. D. Warren Co.
Cole, F. H., Walworth Co.
Collins, Grellet, Dill & Collins Co.
Collins, G. N., International Paper Co., New York.
Collins, H. B., National Cellulose Corp.
Conner, C. M., Electro Bleaching Gas Co.
Conway, J. M., Hoberg Paper & Fibre Co.
Cook, Harry, Armstrong Cork Co.
Cook, O. L., Lehigh Lime Co.
Cooley, C. H., Taylor Logan Papermakers Co. and Advertisers Paper Mills.
Coolidge, P. T.
Cooper, W. C., Electro Bleaching Gas Co.
Copeland, S. B., Eastern Mfg. Co.
Cornell, John, Paper Mill, New York.
Countiss, F. N., International Paper Co.
Cowan, W. W., Dorr Co.
Cowles, E. B., American Engineering Co.
Cowling, C. M., Hawthorne Paper Co.
Coy, J. H., Flambeau Paper Co.
Craig, H. J., S. D. Warren Co.
Crane, W. M., Crane & Co.
Crocker, C. A., Crocker-McElwain Co.
Cronkhite, W. W., General Electric Co.
Crossley, T. L., T. J. Donald & Co., New York.
Crouse, Lester W., Paper Makers Chemical Co.
Crov, Leo E., Menasha Products Co.
Cuddeback, F. E., General Electric Co.
Cummings, Fred A., U. S. Envelope Co.
Curran, C. E., Forest Products Laboratory.
Curtis, F. J., Merrimac Chemical Co.
Curtis, F. A., American Writing Paper Co.

D

Dahl, Jacob, Forest Products Laboratory.
Daley, W. C., Port Huron Sulphite & Paper Co.
Dalton, H. R., Post Telegraph, New York.
Damtoft, W. J., Champion Fibre Co.
Daniels, A. B., L. L. Brown Paper Co.
Darling, A. G., General Electric Co.
Dauman, Samuel, M. Gottesman & Co.
David, W. L., Jr., Della Paper & Pulp Co.
Davidson, P. B., Mellen Institute.
Davis, A. P., Oliver United Filters.
Davis, G. C., G. M. Davis Regulator Co.
Davis, John F., Frank H. Davis Co.
Davis, M. M., Hammermill Paper Co.
Davis, Ralph T., National Sulphite Paper Manufacturers Association.
Dean, B. W., E. D. Jones & Co.
Decker, D. M., Du Pont Grasseli Chemical Co.
DeCew, J. A., Process Engineers, New York.
Demaris, H. A., Chemical Dyestuff Corp.
Dennett, Phillips, Bird Machine Co.
Denison, V. S., Paper & Textile Machinery Co.
Dickerman, C. K., Consolidated Water Power & Paper Co.
Dickinson, H. C., Upper Montclair, N. J.
Dieffenderfer, J. C., Papermakers Chemical Corp.
Diggs, John R., Albemarle Paper Mfg. Co.
Dinkelspiel, M. L., National Paper Products Co.
Dobson, C. E., Southern Kraft Manufacturers Association.
Donaghue, T. F., Warren Mfg. Co.
Donnelley, R. R., Central Waxed Paper Co.
Doughty, R. H., Forest Products Laboratory.
Doyes, Marius, Port Alfred Pulp & Paper Co.
Draudt, Harry W., M. Gottesman & Co.
Drew, A. B. C., Pierpoint Corp.
DuBois, H. A., Kimberly-Clark Corp.
Dubrow, M. C., Writing Paper Manufacturers Association.
Dufford, J. R., Paterson Parchment Co.
Duncan, C. E., Dexter Sulphite Pulp & Paper Co.
Dunn, Theo. W., Dunn Sulphite Paper Co.
Duryea, W. D., Penobscot Chemical Fibre Co.

E

Eaton, Homer, New York City.
Eaton, J. H., Foreign Paper Mills.
Edge, Jacob, Downingtown Mfg. Co.
Edmonds, F. J., Wausau Paper Mills Co.
Egar, Roger J., Bulkley-Dunton Co.
Ekholm, Ivar, National Aniline & Chemical Co.
Eliason, H. D., Detroit Sulphite Pulp & Paper Co.
Ellis, Charles L., Downingtown Mfg. Co.
Eminger, Ernest, Lagerloef Trading Co.
Esleeck, I. N., Esleeck Mfg. Co.
Evans, W. F., Nashua Gummed & Coated Paper Co.
Everest, D. C., Marathon Paper Mills Co.
Ewing, R. D. W., American Writing Paper Co.

F

Faarm, H. S., Watervliet Paper Co.
Fairbanks, S. C., Hamersley Mfg. Co., Garfield, N. J.
Farnsworth, F. C., Farnsworth Co.
Fay, Robert C., American Writing Paper Co.
Feeley, Nelson, Strathmore Paper Co.
Feketie, M. J., Wrenn Paper Co.
Fenska, R. R., New York State College of Forestry.
Ferris, J. E., Electro Bleaching Gas Co.
Ferris, L. C., Patten Paper Co.
Finney, S. N., Moore & White Co.
Finzel, T. G., Du Pont Rayon Co.
Fletcher, S. W., J. O. Ross Engineering Corp.
Ford, W. B., American Glue Co.
Forrest, K. A., Swenson Evaporator Co.
Forsyth, W. L., Victoria Paper Mills.
Fowler, Ralph N., Hampden Glazed Paper & Card Co.
Foxgrover, J. A., Paper Makers Chemical Co.
Francis, A. R., Chromium Corp. of America.
Franklin, B. A., Strathmore Paper Co.
Freeman, H. A., G. M. Davis Regulator Co.
French, A. H., Johns-Manville Co.
Fritz, E. B., Paper Industry, Chicago.
Fulton, W. B., Fulton Engineering Co., Inc.

G

Galloway, W. W., Hagar Straw Board & Paper Co.
Gardner, G. A., M. Gottesman & Co.
Gartland, I. L., Port Huron Sulphite & Paper Co.
Gautier, T. R., Nashua Gummed & Coated Paper Co.
Geohegan, K. P., Aetna Paper Co.
Gephart, O. P., Oxford Miami Paper Co.
Gepheide, G. H., Hawthorne Paper Co.
Gerbrick, W. K., Central Paper Co.
Gibson, Geo. K., Mosinee Paper Mills.
Gibson, Wesley R., Dill & Collins Co.
Gilkey, Geo. W., Michigan Paper Co.
Gilman, Alex. G., Allied Paper Mills.
Gilmore, J. D., Anglo-Canadian Pulp & Paper Mills.
Glass, W. L., Tolhurst Machine Co.
Glatfelter, P. H., P. H. Glatfelter Co.
Gleason, E. P., Nekoosa-Edwards Paper Co.

Gooding, P., Strathmore Paper Co.
Goodsir, Geo., Mid-States Gummed Paper Co.
Gottesman, D. S., M. Gottesman & Co.
Granger, E. R., Chromium Corp. of America.
Grassly, M. H., Strathmore Paper Co.
Greene, G. E., Niagara Paper Mills.
Greene, H. B., Niagara Paper Mills.
Gregor, W. D., Watertown, N. Y.
Greiner, William.
Griffin, R. C., A. D. Little Co.
Griffith, L. L., Jr., Electro Bleaching Gas Co.
Guettler, H. W., Fibre Making Processes, Inc.
Guggenheimer, A. S., United Mfg. Co.

H

Hagara, J. W., Crane Co.
Haggarty, F. J., Jr., Groveton Paper Co.
Hann, C. F., Du Pont Rayon Co.
Hall, Edward L., Whitcomb Envelope Div., U. S. Envelope Co.
Hall, R. E., Worthington Pump & Machinery Corp.
Ham, E. C., John A. Manning Paper Co.
Hamersley, C. S., Hamersley Mfg. Co.
Hammerlund, H. L., Hamersley Mfg. Co.
Halsey, W. D., Hartford Steam Boiler Inspection Co.
Hanly, Don, International Paper Co.
Hardt, Dan, Neenah Paper Co.
Harrigan, H. R., District of Columbia Paper Mfg. Co.
Harrison, H. H., Crystal Tissue Co.
Harrison, W. Y., Grasselli Chemical Co.
Harrower, Norman, Linton Bros.
Harter, Ray, Staley Sales Corp.
Haskell, J. D., Dilts Machine Co.
Hasting, A. C., Cliff Paper Co.
Hatch, R. S., Pulp Bleaching Corp.
Hay, J. T., Central Steel Corp.
Haynes, E. A., Port Huron Sulphite & Paper Co.
Hayward, R. A., Kalamazoo Vegetable Parchment Co.
Haywood, Gerald, West Virginia Pulp & Paper Co.
Heath, W. L., International Paper Co., Southern Div.
Hellstrom, G. L. M., Paper Machinery, Ltd.
Henderson, Douglas, Stratton Engineering Co.
Henry, F. R., Simon, Worden, White.
Herrlinger, E. F., Gummed Products Co.
Hersey, Ralph B., Hollingsworth & Vose.
Hesley, J. J., Jr., Merrimac Chemical Co.
Heim, Milton J., National Adhesives Corp.
Helder, H. A., Champion Fibre Co.
Hendrich, Walter, Collins Mfg. Co.
Hendricks, C. J., Consolidated Water Power & Paper Co.
Hendrickson, S. M., Magnuson Products Corp.
Henson, J. J., Champion Coated Paper Co.
Heritage, C. C., Oxford Paper Co.
Heuser, E., Canadian International Paper Co.
Hicks, J. F. G., Bureau of Standards.
Higman, H. B., Boothby Fibre Can Co.
Hill, R. P., Pulp Bleaching Corp., New York.
Hilton, Paul P., Johns-Manville Corp.
Hinkson, J. R., Hampden Glazed Paper & Card Co.
Hinman, E. S., P. H. Glatfelter Co.
Holmes, Jos. E., Crocker-McElwain Co., and Chemical Paper Mfg. Co.
Hopkins, Harold R., Oxford Paper Co.
Horne, Franklin H., J. H. Horn & Sons Co.
Hose, A. V., Atwood & Morrill.
Houghton, Leonard I., Glazed & Fancy Paper Manufacturers Association.
Houk, Geo. W., Hawley Pulp & Paper Co.
Housen, M., Irving Paper Co.
Hovey, R. W., Oxford Paper Co.
Howard, Major A. E.
Howell, R. W., R. T. Vanderbilt Co.
Howes, Willis H., Knowlton Bros.
Hughes, Gordon W., Inland Lime Stone Co.
Hurtubis, C. W., Hammermill Paper Co.
Hyde, John, S. D. Warren Co.

I

Ingraham, H. G., V. D. Simons.
Ireland, R. H., Crane Co.
Irving, C. C., Falulah Paper Co.

J

Jackson, P. Andrew, American Writing Paper Co.
James, Arthur L., Holyoke Card & Paper Co.
Jarrell, T. D., U. S. Department of Agriculture.
Johnson, B., Hammermill Paper Co.
Johnson, C. P., Penberthy Injector Co.
Johnson, C. James, Container Corp. of America.
Johnson, C. J., Container Corp. of America.
Johnson, W. O., Strathmore Paper Co.
Johnson, Warren S., Curtis & Bro. Co.
Johnston, H. W., Forest Products Laboratory of Canada.
Johnston, Jos. E., Lowe Paper Co.
Johnstone, E. J., Paper Makers Chemical Co.
Jones, E. W., John A. Manning Paper Co.
Jones, S. M., Brownville Paper Co.
Jonte, L. E., Hoberg Paper & Fibre Co.

K

Kelley, E. W., Union Waxed & Tissue Paper Co.
Kellogg, R. S., Sec., News Print Service Bureau.
Kennedy, A. J., Sandy Hill Iron & Brass Works.
Kennedy, G. F., Hercules Powder Co.
Kern, C. J., Moore & White Paper Co.
Kiefer, Francis, Canada Forwarding Co.
Kiely, Miss, American Writing Paper Co.
King, A. H., Crocker-McElwain Co.
King, Kenneth T., Du Pont Co.
Kinne, C. E., Hercules Powder Co.
Kinney, H. C., Bagley & Sewall.
Klein, A. F., Hammermill Paper Co.
Klund, Frederic P., Hammermill Paper Co.
Knight, John G., Paper Makers Chemical Co.
Knode, S. C., Alemarle Paper Mfg. Co.
Knoll, R. J., Scott Paper Co.
Knott, H. R., Eastern Mfg. Co.
Knowlton, F. H., Staley Sales Corp.
Koenig, Paul, Continental Paper & Bag Corp.
Koroleff, A. M., Canadian Pulp and Paper Association.
Kramer, H. W., A. M. Collins Mfg. Co.
Kranzler, Fred, Continental Paper & Bag Corp.
Kress, Otto, Paper Institute of Chemistry.
Krimmel, M. A., Hammermill Paper Co.
Kumler, R. W., Bennett, Ltd.

L

Lafontaine, G. H., Bennett, Inc.
Laftman, R. H., Bogalusa Paper Co.
Lee, James, Chemical & Metallurgical Engineering.
Leeper, Guy, Bay West Paper Co.
Leeper, R. W., Canadian General Electric Co.
Lehtinen, Wm., Enso-Gutzeit Osk.
Lerch, E., Continental Paper & Bag Corp., New York.
Lincoln, Carl E., Geo. W. Wheelwright Paper Co.
Linforth, A. S., Empire Paper Mills, England.
Libby, C. E., New York State College of Forestry.
Liebeck, Harry, Scott Paper Co.
Lindquist, H. E., Missisquoi Pulp & Paper Co.
Lindsay, W. A., Tarentum Paper Mills.
Little, J. S., Westinghouse Electric & Mfg. Co.
Lloyd, W. H., Dill & Collins Co.
Lockyer, S. S., Brown Co.
Lovett, M., National Waterproofing Co.
Lowe, M. B., Lowe Paper Co.
Lynch, J. O., Eastern Mfg. Co.

M

Macdonald, R. G., Sec., Technical Association of the Pulp and Paper Industry, New York.
Macdowell, H. G., Pusey & Jones Corp.
Macklem, G. A., Beloit Iron Works.
MacNaughton, W. G., International Paper Co., New York.
Madden, Russell S., American Writing Paper Co.
Main, F. W., Worthy Paper Co.
Mair, Ralph, Dill & Collins Co.
Makodzub, Amtorg Trading Corp., New York.
Marcuse, I. J., Bedford Pulp & Paper Co.
Marcuse, M. E., Bedford Paper & Pulp Co.
Mason, J., Jr., Edgar Bros. Co., New York.
Maull, W. R., Dill & Collins Co.
Maves, A. E., Continental Paper Co., Bogota, N. J.
McBain, B. T., Portland, Ore.
McCaskey, R. C., Coated Paper Products Co.
McClellan, W. S., P. H. Glatfelter Co.
McDonald, E. J., Groveton Paper Co.
McDowell, J. N., Carew Mfg. Co.
McDuffee, C. H., Claremont Paper Co.
McEwan, John, American Tissue Mills.
McGrath, Louise E., Booth Chemical Paper Co., Elizabeth, N. J.
McKee, R. H., Columbia University.
McLean, A. B., Smallwood Stone Co.
McLintock, A., Texas Gulf Sulphur Co., 75 E. 45th St., New York.
McNulty, C. N., Texas Gulf Sulphur Co.
Mead, W. L., Consolidated Water Power & Paper Co.
Meade, Henry S., Wrenn Paper Co.
Meese, Norman S., Bureau of Foreign and Domestic Commerce.
Meighan, M. H., Lehigh Portland Cement Co.
Melker, A. R., 110 East 42nd Street, New York.
Merrill, A. D., Chemical Pulp Process.
Meyer, E. A., Badger Paper Mills, Inc.
Miller, A. E., Cornell Wood Products Co.
Miller, J. B., York Haven Paper Co.
Miller, I. H., Standard Envelope Mfg. Co.
Miller, R. N., Oxford Paper Co.
Mills, O. J., Sandy Hill Iron & Brass Works.
Millspaugh, W. H., Engineering Club, New York.
Minor, Miss J. E., Rag Content Manufacturers Association.
Minton, Ogden, Minton Vacuum Dryer Co.
Misch, A., Glory Tissue Corp.
Mitchell, H. D., Link Belt Co.
Mittendorf, T. N., Mid-States Gummed Paper Co.
Moon, D. G., International Paper Co.
Moore, Arthur W., Shawmut Waxed Paper Co.
More, Geo. W., Geo. W. Millar & Co., Inc.
Morris, H. C., Hercules Powder Co.
Morrison, F. J., Hummel-Ross Fibre Corp.
Morrison, H. A., Oliver United Filters.
Morse, C. S., Valley Paper Co.
Moses, K. L., Groveton Paper Co.
Muller, C. E., Paper Makers Chemical Corp.
Mullen, T. H., Claremont Paper Co.
Munro, W. A., Munising Paper Co.
Munroe, Chas. F., Franklin Paper Co., Holyoke, Mass.
Murchison, D. C., Howell & Murchison Co.
Murdock, H. R., Champion Fibre Co.
Murphy, J. M., Solvay Sales Corp.
Murray, D. E., Flintkote Co.
Myers, S. E., Merritt Engineering Sales Co.

N

Naegeli, Fred, J. M. Huber Co.
Nash, James B., Nekoosa-Edwards Paper Co.
Naylor, Emmett H., Writing Paper Manufacturers Association.
Neumeyer, Wm. E., Neumeyer & Dimond.
Newhall, Chas. A., Consulting Chemist, Rep., Everett Pulp & Paper Co.
Newman, W. C., General Electric Co.
Nichols, L. B., Hollingsworth & Vose Co.
Nickerson, A. W., Process Engineers, New York.
Nilson, C. N., E. D. Jones & Sons Co.
Nivling, W. A., Huron Milling Co.
Nixon, W. L., American Writing Paper Co.
Noble, J. H., Oliver Filter Co.
Noblin, R. L., Victoria Paper Mills.
Norseen, Harold, New York State College of Forestry.
Norstrand, H. P. G., Saranac Pulp & Paper Co.
Norton, W. J., American Writing Paper Co.
Nystrom, C. N., Thilmany Pulp & Paper Co.

O

Obermans, H. G., Hammermill Paper Co.
Oberweiser, E. A., Whiting-Plover Paper Co.
O'Connor, J. J., Mead Pulp & Paper Co.
Offenhauer, B. F., Champion Coated Paper Co.
Olmstead, Geo., S. D. Warren Co.
Olsson, Elis, Chesapeake Corp.
O'Rourke, L. A., Eaton Paper Co.
Osborne, M. C., Dilts Machine Works, Inc.
Osborne, F. H., C. H. Dexter & Sons.
Osborne, W. Irving, Jr., Cornell Wood Products Co.
Ostrander, Geo. N., Finch, Pruyn & Co.
Otis, Spencer, Jr., Chicago.
Owen, Allen P., United States Rubber Co.
Owens, Elwin J., Orange, Mass.

P

Paine, C. G., Eastern Mfg. Co.
Parham, R. J., St. Regis Paper Co.
Parsons, J. L., Hammermill Paper Co.
Partsch, F. W., J. O. Ross Engineering Co.
Patterson, J. L., Hammermill Paper Co.
Patch, Clifford, Eastern Mfg. Co.
Pattillo, B. K., National Aluminate Corp.
Pearson, F. A., Pearson Laboratories, 65 Park Ave., Apt. 3, New York.
Pease, R. L., Brownville Paper Co.
Pease, R. O., Nashua River Paper Co.
Peterson, F. C., New York State College of Forestry.
Peterson, M. F., U. S. Envelope Co.
Peto, C. B., Hammermill Paper Co.
Petri, B. M., Eastern Mfg. Co.
Phipps, C. H., Watab Paper Co.
Phillips, Wm. E., Mathieson Alkali Works, Inc.
Pierce, T. E., U. S. Envelope Co.
Pilz, W. J., Everett Pulp & Paper Co.
Piper, W. E., Dorr Co.
Platt, Arthur, Hollingsworth & Vose Co.
Pollak, Arthur, West Virginia Pulp & Paper Co.
Porter, O. M., Sec., National Kraft Paper Manufacturers Association.
Powers, W. C., Peter Dixon & Son, Ltd.
Prescott, J. P., Collins Mfg. Co.
Prior, P. H., Aylesford Paper Mills, England.
Puffer, E. L., Heller & Merz Co.

Q

Quirk, D. L., Jr., Peninsular Paper Co.

R

Racknagel, A. B., Empire State Forest Products Association.
Rafton, H. R., Andover, Mass.
Ramage, James B., Franklin Paper Co.
Ramsey, W. K., U. S. Envelope Co.
Rancke, Z. W., Crystal Tissue Co.
Randall, A. T., Eaton-Dikeman Co.
Rappold, H. G., J. O. Ross Engineering Corp.
Rasmussen, C. F., Chicago.
Ray, H. F., Scott Paper Co.
Raybold, W. J., Rising Paper Co.
Raymond, W. L., International Paper Co.
Redfield, A. W., Munising Paper Co.
Reed, E. O., Crane Co.
Reed, R. F., University of Cincinnati.
Reilly, James A., American Writing Paper Co.
Renner, O. W., Geo. W. Wheelwright Paper Co.
Reynolds, L. C., American Writing Paper Co.
Reynolds, Ira S., Dells Paper & Pulp Co.
Rhoads, R. F., Mead Pulp & Paper Co.
Rhodes, C. F., International Paper Co.
Rhodes, C. M., Flintkote Co.
Rice, G. A., W. C. Stebbins Co.

Richmond, O. P., Strathmore Paper Co.
Richter, A. F., Stebbins Engineering & Mfg. Co.
Richter, C. F., Stebbins Engineering & Mfg. Co.
Richter, G. A., Brown Co.
Richter, H. W., Geo. O. Jenkins Co.
Rider, B. I., Victoria Paper Mills.
Rieg, J. B., Erving Paper Mills.
Rising, R. B., Rising Paper Co.
Rivise, C. W.
Roberts, E. B., Bemis Bros. Bag Co.
Robert, R. M., Foreign Paper Mills.
Roberts, J. R., E. I. DuPont de Nemours & Co.
Robinson, J. T., American Writing Paper Co.
Robsin, C. P., Borregaard Co., New York.
Roe, W. O., Individual Drinking Cup Co.
Rogers, H. W., General Electric Co.
Roll, Fred A., Wrenn Paper Co.
Rosmit, J. A., Continental Paper & Bag Corp.
Ross, C. T., U. S. Envelope Co.
Ross, J. O., Ross Industries.
Ross, Lawrence, Union Bag & Paper Corp.
Ross, Walter S., American Mfg. Co.
Rothschild, H. A., Kimberly-Clark Corp.
Rue, John D., News Print Service Bureau.
Rueben, M. R., York Haven Paper Co.
Russell, J. R., Marathon Paper Mills Co.
Ryland, James, Standard Paper Mfg. Co.

S

Saecker, C. E., Appleton Machine Co.
Sanburn, J. C.
Sargent, Philip A.
Savery, T. H., Jr., Bird Machine and Nash Engineering Co.
Savery, W. H., U. S. Pulp Manufacturers Association.
Sayle, William E., National Envelope Co. Div.
Schafer, E. F., Forest Products Laboratory.
Schmidt, J. Carl, E. I. du Pont de Nemours & Co.
Schneider, C. C., Hawthorne Paper Co.
Schock, John, Newton Falls Paper Co.
Schwalbe, H., Dill & Collins Co.
Scribner, B. W., Bureau of Standards, Washington, D. C.
Scully, R. T., General Electric Co.
Shonkweiler, F. L., Fulton Engineering Co.
Seaman, S. E., Du Pont Rayon Co.
Secrest, R. A., U. S. Envelope Co.
Sentman, M. R., J. H. Day Co.
Shaw, E. C., Norwood Engineering Co.
Shaw, M. B., Bureau of Standards.
Sheldon, Benj. I., M. Gottesman & Co.
Shenk, M. S., National Adhesive Co.
Shepard, H. B.
Shepherd, J. B., Peninsular Paper Co.
Sherman, J. R.
Sherwood, A. L., National Folding Box Co.
Shipway, C. M., Wm. E. Hooper & Sons Co.
Shoemaker, W. M.
Shonkweiler, F. L., Fulton Engineering Co.
Shubert, C. A., Dill & Collins Co.
Siegel, A. J., M. Gottesman & Co.
Simons, F. L., Rogers Fibre Co.
Sinclair, Harold, Bennett, Ltd.
Simmons, F. T. E., Racquette River Paper Co.
Sisson, G. W., 3rd, Racquette River Paper Co.
Sisson, Geo. W., Jr., Racquette River Paper Co.
Sisson, Lewis H., Racquette River Paper Co.
Skinner, H. J., Skinner, Sherman, Esselen.
Skioldebrand, C., G. D. Jenssen Co.
Slater, Jos. H., Escanaba Paper Co.
Smith, A. F., General Electric Co.
Smith, Albert R., Keith Paper Co.
Smith, C. B., Huron Milling Co.
Smith, Carlton W.
Smith, D. A., District of Columbia Paper Mfg. Co.
Smith, Edward C., Nashua Gummed & Coated Paper Co.
Smith, Elmer C., Cherry River Paper Co.
Smith, R. W., Bird Machine Co.
Snell, R. M., Paper Makers Chemical Co.
Snyder, G. M., Cherry River Paper Co.
Snyder, Harry M.
Spangler, S., Schmidt & Ault Paper Co.
Spawn, J. Norman, Champion Fibre Co.
Spence, Geo. K., Castanea Paper Co.
Spencer, Geo. H., Minton Vacuum Dryer Co.
Spicerman, C. W., Whiting-Plover Paper Co.
Spickerman, C. W., Whiting-Plover Paper Co.
Spier, L., Starch Products Co.
Spooner, H. S., Howard Paper Co.
Stallman, C. H., P. H. Glatfelter Co.
Stamm, F. C., Upson Co.
Standerwick, R. G.
Steadman, B. K., Standard Paper Mfg. Co.
Stephenson, J. N., Pulp & Paper Magazine of Canada.
Stevens, Frank W.
Stevens, R. D.
Stevens, R. H., Bogalusa Paper Co.
Stevens, S. S., Stevens & Thompson Paper Co.
Stevenson, L. T., Mountain Mill Paper Co.
Steward, L. B., Gardiner, Me.
Stoltz, R. R., Westinghouse Electric & Mfg. Co.
Stone, Norman S., Mosinee Paper Mills.
Stone, Ray E., Curtis & Bros. Co.
Story, A. P., Chillicothe Paper Co.
Stuart, Kimberly, Neenah Paper Co.
Sullivan, J. J., Jr.
Summers, L. T., Port Huron Sulphite & Paper Co.
Suterneister, E., S. D. Warren Co.
Sutherland, D. Manson, Jr., Trenton, N. J.
Sutton, H. M., Bird Machine Co.
Swenning, K. A., Mead Pulp & Paper Co.
Swett, Clifford, Albemarle Paper Mfg. Co.
Swift, Marion, Paper Makers Chemical Co.
Switzer, P. D., Moore & White Co.

T

Taft, Roger B.
Tait, C. R., Hammermill Paper Co.
Tanyane, A. A., Paper Trade Journal.
Taylor, Frank E., Taylor-Logan Co., Papermakers.
Taylor, K. A., Oxford Paper Co.
Telfer, H. R., Detroit Sulphite Pulp & Paper Co.
Thom, E. J., Howard Smith Paper Mills.
Thomas, Eric, Bulkley, Dunton Co.
Thompson, L. A., Paper Makers Chemical Co.
Thompson, S. E., Thompson & Lichtner.
Thorne, F. H., National Aluminate Co.
Thwaite, Herbert, Tissue Paper Manufacturers Association.
Timmerman, F. J., Northern Paper Mills.
Tobias, J. C., Fuller Lehigh Co.
Townsend, C. W., Logan, Swift & Brigham.
Traqure, John, Mead Pulp & Paper Co.
Trautschold, R., Paper Trade Journal.
Tucker, E. C., Crocker-McElwain Co.
Tucker, E. F., Stebbins Engineering Co.
Tumy, P. Y., General Electric Co.
Tunstall, H. W., A. M. Collins Mfg. Co.
Turner, H. H., Defiance Paper Co.

U

Uong, D. D., Fitchburg Paper Co.

V

Vanderberg, H. L., Staley Sales Corp.
Van Duzer, I. O., Louis Dejonge & Co.
Vaugh, Frank, Bay West Paper Co.
Van Horn, John B., Holyoke Card & Paper Co.
Van Hazmburg, R. S., Scott Paper Co.

W

Wade, J. M., General Electric Co.
Wadleigh, G. R., West Virginia Pulp & Paper Co.
Waenke, E. M., Certified Dry Mat Corp.
Waern, A. W., Champion Fibre Co.
Walker, E. C., Collins Mfg. Co.
Walker, Edwin M., American Writing Paper Co.
Walsh, Thos. Compton, Hollingsworth & Vose Co.
Ward, R. C., Atwood & Morrill.
Ware, Geo. A., News Print Service Bureau.
Waring, Arthur N., Fletcher Paper Co.
Warner, E. E., General Electric Co.
Warner, S. T., Fuller Lehigh Co.
Waters, C. D., Newton Falls Paper Co.
Watson, R. S., Allis-Chalmers Mfg. Co.
Weedon, D. R., Hungerford & Terry.
Wehmer, P. F., Electro Testing Labs.
Wehmhoff, B. L., Government Printing Office.
Wells, S. D., Paper Mills Laboratories.
Welsh, L. Vincent, Union Screen Plate Co.
Wemple, H. R., Texas Gulf Sulphur Co.
Wesley, John A., Rhinelander Paper Co.
West, W. L., J. H. Horn & Sons Co.
Weston, H. D., Paper Industry.
Weston, Philip, Byron Weston Co.
Westveld, M., U. S. Forest Service.
Wheat, G. G.
Wheeler, T. B., A. P. W. Paper Co.
Wheelwright, Geo. W., Geo. W. Wheelwright Paper Co.
Whipple, C. B., Beloit Iron Works.
White, E. L., U. S. Envelope Co.
White, R. B., White-Washburn Co.
Wholean, G. R., Strathmore Paper Co.
Wiberg, A., Gilbert Paper Co.
Widmer, S. W., West Virginia Pulp & Paper Co.
Wilcox, D. A., Oxford Paper Co.
Wiley, Brent, Westinghouse Electric & Mfg. Co.
Wilkins, R. A., Bird & Son, Inc.
Wilkinson, C. H., Kent Paper Co.
Wilkinson, W. N., Supply & Equipment Section, American Paper & Pulp Association.
Willemain, E. H., American Writing Paper Co.
Willets, W. R., Western Electric Co.
Williams, F. M., Williams Apparatus Co., New York.
Williamson, G. E., Strathmore Paper Co.
Willis, T. F., Willis & Weber Paper Co.
Willson, S. L., American Writing Paper Co.
Wing, Wm. C., Fox River Paper Co.
Wingate, H. A., C. H. Dexter & Sons, Inc.
Winslow, F. E., General Electric Co.
Wolf, Philip de, Goslin & Joubert Co.
Wolf, R. B., Pulp Bleaching Corp., New York.
Wood, Fred L., U. S. Envelope Co.
Wood, L. G., Northern Paper Mills.
Woodsome, J. O., Penberthy Injector Co.
Woodson, W. S., Jr., U. S. Rubber Co.
Worker, Jos. C., American Engineering Co.
Wright, A., Filtration Engineering Co.
Wright, C. R., Waterproof Paper & Board Co.
Wyatt, S. D., Paper Industry.

Z

Zabriskie, S. C., Zabriskie, Inc.
Zellerbach, I., National Paper Products Co.

LUZERNE PLANT SOLD

The plant of the Luzerne Paper Corporation was purchased this week at a receiver's sale by the New York Power and Light Company for $155,000. By the acquisition the power company secures control of one of the most valuable water power sites in Northern New York. Under the terms of the sale the paper company will receive $60,000 in cash and $95,000 in bonds. The sale was conducted at the local mill by L. E. Stewart, trustee of the company. It is understood that the plant will be operated as a paper mill for several months and may be continued in the paper manufacturing business until the new owners find it advisable to erect an electric power plant on the site. Following a recent conference between the receiver and creditors of the firm it was announced that prominent business men at Albany were considering a proposition to take over the property, but this deal was being finally abandoned.

The problem of erecting a power plant near the mill property has been under consideration by the power corporation for several years and it is believed that a plant will be under construction soon. The operation of the property, however, as a paper mill necessitates the employment of a larger number of men.

TO PRINT WALL PAPER AT ATLAS

Reopening of the Atlas mill of the Kimberly-Clark Corporation at Appleton, Wis., as a wall paper printing plant was announced on Saturday by F. J. Sensenbrenner, president. The paper manufacturing portion of the mill was closed down about a month ago when these operations were transferred to the newly acquired Lakeview mill at Neenah, Wis.

Two small paper machines housed in the Atlas mill have been sold and are being dismantled. As soon as this has been done, the company will install six wall paper printing machines and will begin producing for the markets. Wall paper has been manufactured for some time as one of the specialty lines but only tinted stock has been prepared for the trade by the Kimberly-Clark Corporation. The printing operations will extend the line and add another product to the long list now produced by the company.

This mill was acquired by the Kimberly-Clark Corporation in 1907 when it was known as the Atlas Paper Co. It was kept in full operation until about a month ago, but the converting department has continued as usual. The printed wall paper was added so as to give employment to a number of additional men, and also to keep the building in use.

GENERAL PAPER MERCHANTS MEET

National Paper Trade Association of the U. S. A. Holds Twenty-Seventh Annual Convention at The Pennsylvania Hotel, New York

K. S. Warner, of John F. Sarle Co., Inc., New York City, Is Chosen President for the Ensuing Year—Arthur W. Blackman of the D. F. Munroe Co., Boston, Mass., Heads Wrapping Paper Division and J. Frank Miller, of Chope-Stevens Paper Co., Detroit, Mich., Fine Paper Division — Charles Addoms, of Miller & Wright Paper Co., New York City, Is Continued as Treasurer—The Convention Is Well Attended.

K. S. WARNER, of the John F. Sarle Company, Inc., New York, was chosen president of the National Paper Trade Association of the United States at the twenty-seventh annual convention of the association at the Pennsylvania Hotel, New York, February 17 to 19 inclusive.

Other Officers

The other officers were elected as follows: Vice President, in Charge of Wrapping Paper Division, Arthur W. Blackman, D. F. Munroe Company, Boston, Mass.; Vice President, in Charge of Fine Paper Division, J. Frank Miller, Chope-Stevens Paper Company, Detroit, Mich.; Treasurer, Charles Addoms, Miller & Wright Paper Company, New York; Executive Secretary, Frank E. Floyd, 420 Lexington avenue, New York.

President's Address

H. W. Mathewson, president, delivered his annual address as follows:—

In opening this general meeting of the National Paper Trade Association, the last one at which I will preside as President, I wish to comment on the activities of our Association during the three years or four years I have held office.

Marked Progress

I believe that the Association activities have progressed to a very marked degree. Your Board of Directors have had many meetings, together with the regular session; and as you are aware, the personnel of your Executive Office has somewhat changed. I am sure that the mental attitude of the membership towards Association activities and endeavor is such that they wish to learn all they can because there is a continual changing picture in the distributing problem.

We are to be congratulated in our having Frank Floyd at the head of our activities in the New York office. He is a man that all the manufacturers have confidence in, and, of course, we that have known him for so long, not only have confidence in him but love him.

K. S. WARNER, PRESIDENT

I feel confident that conditions in the paper industry are in far better condition because of his watchful eye and his activities in behalf of the National Paper Trade Association. The conditions in our industry will improve in proportion to the individual endeavor of each and every one of us to work for that end, and we all appreciate that Mr. Floyd cannot work miracles. He must have the full cooperation of every member to help better our industry. Each one of us is responsible for the conditions of our industry. If you, and I am sure you do, want conditions more ideal, do your part and in so doing, you will help your own business, and the industry.

The several committees in both the Fine and Wrapping Paper Division have done a good deal of constructive work. The Fine Division, under the guiding hand of Mr. K. S. Warner, has continually kept its ear to the ground and is quietly watching developments, which have not been many but some of which have been very acute. I wish to particularly refer to the endeavor of the Fine Paper Division to formulate plans which better the conditions of our membership regarding credits. There has been, throughout the country, a very interesting plan put into effect by the various merchants, all of which I believe will be conducive of profitable returns. This plan, however, is individual in its scope and does not contemplate a uniformity of action at the present time but it is very certain that the same has been a great benefit to various paper merchants in different localities.

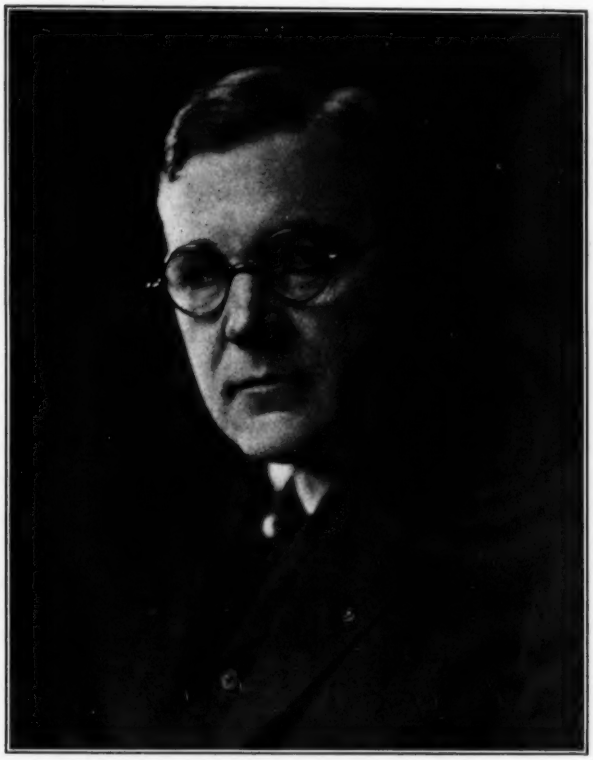
If you will pardon my reference to my home market, I believe that I can truthfully say that the cradle of the better credit situation was started in Minneapolis twenty years ago, and in just the last month we have extended this system to outlying territories with the full cooperation of adjacent markets.

You are all aware of the many other activities and in going over the same, we cannot help but refer to the Survey Committee of the Wrapping Paper Division, also the Twine and Kraft Committees of the same division. These committees have been working very hard, under the supervision of Mr. Arthur Blackman, Vice President in charge of the Wrapping Paper Division of our Association. They have accomplished much and there is more that they will accomplish.

The Gummed Tape Committee and Bag Committee have held their regular meetings and have made reports to our Conventions which show that their thought has been deep and very good for our Association as a whole. The committees are all functioning but the very nature of their existence does not bring forth in every instance spectacular results that some lines of merchandise naturally promote.

One of the activities that has been brought before you continually for the last five to seven years is the Cost System. If every paper merchant in the United States would install such a system, the paper industry would advance to a higher plane. Knowledge creates better conditions, ignorance makes conditions worse. Put in a Cost System and gain that knowledge. Don't work in the dark any longer.

I cannot help but express to you my sincere appreciation of the help you have all given me. I want you to know that I have enjoyed the contacts which have been my good fortune to have with you. I have been benefited by them.



FRANK FLOYD, SECRETARY

It is my opinion that the paper industry in which we are all so vitally concerned, is on a good foundation. You have heard reports Monday, Tuesday, and this morning in the different meetings you have attended, that inform you that much is being done and that more will be done. I hope that you have all attended these meetings because of the fact that by this attendance you will have learned much that will be of benefit to your business when you return home and fight the battles of the year 1930.

This new year represents the entrance into another decade. It is, indeed, important that we should make these ten years of the thirties profitable and worth living.

Appreciation

I wish to express my appreciation and thanks to all of you and to the members of the different committees, to the chairmen of these different committees that have given their time so unstintingly; to the Vice-Presidents in charge of the Fine and Wrapping Paper Departments, K. S. Warner, in charge of the Fine and Arthur Blackman in charge of Wrapping, to Mr. Floyd and his staff in the New York office.

I wish to assure you that I will continue in my efforts to carry on the paper merchandising business in an honest, honorable and upright manner. I thank you.

Those Who Attended the Convention

Official Registration of the National Paper Trade Association

A

Abramson, H. L., Central States Paper & Bag Co., St. Louis, Mo.
Addoms, Charles, Miller & Wright Paper Co., New York.
Adler, M., Huff Paper Co., Philadelphia.
Alcorn, Jas. E., Alling & Cory Co., Cleveland, Ohio.
Altholz, Leo S., Inlander-Steindler Paper Co., New York.
Andrews, C. R., C. R. Andrews Paper Co., Pittston, Pa.
Andrews, C. Warren, Jr., Industrial Paper Co., Baltimore, Md.
Andrews, E. W., C. R. Andrews Paper Co., Pittston, Pa.
Andrews, R. P., R. P. Andrews Paper Co., Washington, D. C.
Angell, L. W., Carter, Rice & Co., Corp., Boston.
Archibald, A. J., Nekoosa-Edwards Paper Co., Chicago.
Amy, Frank H., Lowe Paper Co., Ridgefield, N. J.
Austin, Harold, Alling & Cory, Rochester, N. Y.

B

Baldwin, C. H., Conrow Bros., New York.
Barton, B. H., Barton, Duer & Koch Paper Co., Baltimore.
Beck, Leon, Charles Beck Co., Philadelphia.
Beckwith, Chas. L., H. W. Carter Paper Co., Springfield, Mass.
Beckwith, R. M., Minneapolis Paper Co., Minneapolis, Minn.
Beggs, G. E., Hubbs & Hastings Paper Co., Rochester, N. Y.
Bement, Edward J., Carter, Rice & Co. Corp., Boston.
Berger, Harry, H. Berger Paper Co., Lawrence, Mass.
Berkowitz, Ben. S., Central Paper Co., Newark, N. J.
Berlau, M., Berlau Paper House, Kansas City, Mo.
Bermingham, J. P., Bermingham & Prosser Co., Kansas City, Mo.
Bernhart, M. E., Miss, Leader Card Works, New York.
Binford, W. W., Andrews Paper Co., Boston.
Black, Ward E., Hoberg Paper & Fibre Co., Green Bay, Wis.
Blackman, Arthur, D. F. Munroe Co., Boston.
Blackman, John F., D. F. Munroe Co., Boston.
Graham Blandy, 2nd, Chas. A. Esty Paper Co., Div., Worcester, Mass.
Bond, Charles W., Charles Beck Co., Philadelphia.
Bond, Benj. F., Jr., B. F. Bond Paper Co., Baltimore.
Borchardt, Henry W., Pilcher & Hamilton Daily Co., Chicago.
Brewer, John H., Storrs & Bement Co., Boston.
Brown, Arthur L., Diem & Wing Paper Co., Cincinnati, Ohio.
Buchanan, J. L., Continental Paper & Bag Corp., New York.
Bull, Richard S., Bradner, Smith & Co., Chicago.
Burgee, Henry, Parsons Paper Co., Holyoke, Mass.
Burke, John C., Baltimore Paper Co., Inc., Baltimore.
Busse, R. W., Chas. F. Hubbs & Co., New York.
Byrne, Matthew O., Whitney Bros., Inc., Boston.

C

Canfield, Chas. E., Canfield Paper Co., New York.
Carpenter, G. E., Carpenter Paper Co., Omaha, Neb.
Carpenter, J. A., Kansas City Paper House, Kansas City, Mo.
Carpenter, Ned, Carpenter Paper Co., Grand Rapids, Mich.
Carter, Huber L., Carter, Rice & Co. Corp., Boston.
Caskie, G. E., Jr., Cashkie-Dillard Co., Lynchburg, Va.
Cauthorne, R. A., Cauthorne Paper Co., Richmond, Va.
Chandler, Alan, Alling & Cory Co., Pittsburgh, Pa.
Chase, Howard E., W. H. Claflin & Co., Inc., Boston.
Clayton, Robert G., Sheridan-Clayton Paper Co., St. Joseph, Mo.
Clerk, Geo. S., Hudson Valley Paper Co., Albany, N. Y.

Cleveland, W. G., E. C. Palmer & Co., New Orleans, La.
Clifford, Scot B., C. P. Lesh Paper Co., Indianapolis.
Coal, H. M., Vandewater Paper Co., Inc., New York.
Considine, N. A., Paper House of Penna., Philadelphia.
Coring, A. J., Hubbs & Corning Co., Baltimore.
Cosby, A. F., American Writing Paper Co., Holyoke.
Cree, Thomas K., Alling & Cory Co., Pittsburgh, Pa.
Cummings, E. Lindsay, Storrs & Bement Co., Providence, R. I.

D

Daily, John J., Pilcher-Hamilton-Daily, Chicago.
Danchy, James S., Schwarz Paper Co., Chicago.
Dearden, C. W., Rourke-Eno Paper Co., Hartford, Conn.
Decker, R. H., Marquardt, Blake & Decker, New York.
Doremus, H. W., Chas. F. Hubbs Co., New York.
Dunning, W. B., Logan Paper Co., Inc., Auburn, N. Y.
Dutcher, Roy F., Rourke-Eno Paper Co., Hartford, Conn.
Dyer, D. B., Wisconsin Paper & Products Co., Milwaukee, Wis.

E

Eaton, E. A., A. M. Eaton Paper Co., Boston.
Ebbets, Wm. E., Coy, Disbrow & Co., Inc., New York.
Esty, C. A., Carter, Rice & Co., Boston.

F

Faram, H. S., Watervliet Paper Co., Watervliet, Mich.
Field, C. R., Field, Hamilton, Smith Paper Co., Omaha.
Finch, Don M., Crown Paper & Bag Co., Jackson, Mich.
Franc, Jerome, Franc-Graham Paper Co., Inc., New York.
Freedman, J. N., S. Freedman & Sons, Washington, D. C.
Friedman, J., City Paper Co., Birmingham, Ala.

G

Gardner, Leroy L., R. S. Greene Paper Co., Providence, R. I.
Gascon, Martin D., Alling & Cory Co., Cleveland, Ohio.
Goldsnoul, Charles L., Globe Paper Co., Cleveland, Ohio.
Graham, W., Franc-Graham Paper Co., New York.
Grazelle, Wm. R., Holland Paper Co., Buffalo, N. Y.
Gregor, W. D., Watertown, N. Y.
Ham, Arthur E., Arthur E. Ham & Sons, Boston.

H

Hanlon, Lou L., Alling & Cory Co., Buffalo, N. Y.
Harndin, George, General Electric Co., Schenectady, N. Y.
Harold, C. A., R. M. Myer & Co., Inc., Rochester, N. Y.
Hearn, F. E., Hearn Paper Co., Youngstown, Ohio.
Heffron, W. C., A. P. W., Albany, N. Y.
Helmer, Harold, Beecher, Peck & Lewis, Detroit.
Herrman, W. J., E. A. Bauer Co., Milwaukee, Wis.
Higman, H. B., Boothby Fibre Can Co., Boston.
Hoadley, D. A., Carpenter Paper Co., Omaha, Neb.
Holden, Wm. H., Geo. W. Millar & Co., New York.
Hopkins, Forest, Paper Mills Co., Chicago.
House, A. J., Union Paper & Twine Co., Detroit.
Hubbard, Calvin B., B. F. Bond Paper Co., Baltimore.
Hubbs, Chas. F., Chas. F. Hubbs & Co., New York.
Hugh, A. D., Continental Paper & Bag Corp., Baltimore.
Hurlbert, Hartley A., Hurlbert & Hatfield, Boston.
Hyman, Harry Z., L. Hyman & Sons, New York.

I

Ihsen, Henry G., Hubbs & Howe Co., Cleveland, Ohio.
Iseu, N. D., Enterprise Paper Co., Philadelphia.

J

Johnson, G. P., Charles Beck Co., Philadelphia.
Johnston, Dean Y., Chatfield Paper Corp., Cincinnati, Ohio.
Johnston, Robert S., Old Dominion Paper Co., Norfolk, Va.
Jones, H. L., Individual Drinking Cup Co., Inc., Easton, Pa.
Jones, J. B., Western Newspaper Union, Omaha, Neb.
Jones, Sydney L., Hudson Valley Paper Co., Albany, N. Y.
Judd, B. A., Petrequin Paper Co., Cleveland, Ohio.

K

Kelm, A. B., Paramount Paper Products Co., Philadelphia.
Keil, Harold W., Millcraft Paper Co., Cleveland, Ohio.
Keller, Edw. M., Lowe Paper Co., Ridgefield, N. J.
Kenneth, T. F., S. Walter, Inc., Philadelphia.
Kettles, R. C., Chas. F. Hubbs & Co., New York.
Kiesewetter, M., Antietam Paper Co., Hagerstown, Md.
Keim, Alfred, J. E. Linde Paper Co., New York.
Klem, A. C., Sensheimer Paper Co., Cincinnati, Ohio.
Koch, Chas., Barton, Duer & Koch Paper Co., Washington, D. C.
Kruger, H. W., Lowe Paper Co., Ridgefield, N. J.

L

Lazenby, Eugene H., Industrial Paper Co., Baltimore, Md.
Leach, L. F., Kansas City Paper House, Oklahoma City, Okla.
Leland, D. E., Mumford Paper Mills, Inc., Mumford, N. Y.
Lesh, Perry W., C. P. Lesh Paper Co., Indianapolis, Ind.
Leslie, A. W., John Leslie Paper Co., Minneapolis, Minn.
Liebman, M., Gotham Card & Paper Co., Jersey City, N. J.
Likins, G. R., Springfield Paper Co., Springfield, Mo.
Linde, Bertram, J. E. Linde Paper Co., New York.
Lindenmeyr, Fritz, Henry Lindenmeyr & Sons, New York.
Lipscomb, B. W., Richmond Paper Co., Richmond, Va.
Little, Edward H., John Carter & Co., Inc., Boston.
Logan, Alford W., Providence Paper Co., Providence, R. I.
Loudergan, J. H., Henry Lindenmeyr & Sons, New York.
Lowe, Malcolm B., Lowe Paper Co., Ridgefield, N. J.

M

Maglathlin, Carl W., Lindsay Paper Co., Philadelphia.
Mahon, L. D., B. F. Bond Paper Co., Baltimore.
Mallalieu, J. C., Geo. W. Millar & Co., Inc., New York.
Marquardt, Oswald F., Marquardt, Blake & Decker, Inc., New York.
Marshall, Louis J., Marshall Paper Co., Appleton, Wis.
Martin, E. S., Epes-Fitzgerald Paper Co., Richmond, Va.
Marz, G. A., J. F. B. Garrett Co., Syracuse, N. Y.
Mathewson, H. W., Paper Supply Co., Minneapolis, Minn.
McGehee, C. G., Jacksonville Paper Co., Jacksonville, Fla.
McGrath, Robert E., Joseph I, Grady, Inc., New York.
McKinney, Geo., F. A. Flinn, Inc., New York.
McLaughlin, W. C., Chatfield Paper Corp., Cincinnati, Ohio.
Meade, Ernest C., Richmond Paper Co., Richmond, Va.
Merriam, Edward J., Merriam Paper Co., New York.
Meyer, Karl F., Schwarz Paper Co., Lincoln, Neb.
Meyer, S. L., Louisiana Paper Co., Ltd., Shreveport, La.
Miller, Albert M., Central Ohio Paper Co., Columbus, Ohio.
Miller, J. F., Chope-Stevens Paper Co., Detroit.
Miller, James H., Standard Envelope Mfg. Co., Cleveland, Ohio.
Miller, R. W., Central Ohio Paper Co., Columbus, Ohio.
Moody, W. F., G. W. Moody & Son, New Castle, Pa.
Morehouse, H. J., Individual Drinking Cup Co., Inc., Easton, Pa.
Morgan, C. A., Cramer-Force Co., Rochester, N. Y.
Moody, W. F., G. W. Moody & Son, New Castle, Pa.
Morrisett, R. E., Dillard Paper Co., Greensboro, N. C.
Mueller, G. A., Midland Paper Co., Chicago.
Myers, R. E., R. M. Myers & Co., Inc., Rochester, N. Y.

N

Nesbitt, A. T., Cincinnati Cordage & Paper Co., Cincinnati and Dayton, Ohio.
Nesbitt, Don, Cincinnati Cordage & Paper Co., Dayton, Ohio.
Newell, H. T., Jackson Paper Co., Jackson, Miss.
Newfang, Carl A., Canfield Paper Co., New York.
Newhall, Charles A., Consulting Chemist, 2705 Smith Tower, Seattle, Wash.
Newton, Harry, American Paper Co., Milwaukee, Wis.

O

Olmsted, George.
Orchard, H. C., Orchard Paper Co., St. Louis, Mo.

P

Parsons, Frank T., F. T. Parsons Paper Co., Washington, D. C.
Pollock, Lawrence S., Pollock Paper & Box Co., Dallas, Tex.
Pomerance, N. C., Forest Paper Co., New York.
Poore, Leo W., John Carter & Co., Inc., Boston.
Poter, Edgar L., Potter-Taylor Paper Corp., Albany, N. Y.
Pratt, D. W., Butler Paper Corp., Chicago.
Predmore, W., Paper Merchants, Inc., Philadelphia.

R

Reeves, Bert E., Alling & Cory Co., Rochester, N. Y.
Reeves, C. H., Swigart, Paper Co., Chicago.
Reich, Charles, Terminal Shopping Bag Co.
Reich, Samuel, 147 Roebling, Brooklyn, N. Y.
Roach, John E., Fort Hill Paper Co., Boston.
Rockwood, C. D., Union Selling Co., Cincinnati, Ohio.
Roesch, Henry, Roesch Paper Co., Tampa, Fla.
Roesch, R., Union Paper & Twine Co., Cleveland, Ohio.
Rogers, L. E., Bowes Bros., Inc., Utica, N. Y.
Rogers, W. J., Individual Drinking Cup Co.
Rosenthal, N., Rosenthal Paper Co., St. Louis, Mo.
Rothery, L. W., Rothery Bros. Co., New York.
Rourke, William H., Rourke-Eno Paper Co.

S

St. Slair, W. D., Alling & Cory Co., Pittsburgh, Pa.
Schaefer, Wm. N., R. P. Andrews Paper Co., Washington, D. C.
Schillinger, H. Newton, Bradley-Reese Co., Baltimore.
Schlosser, Morris, M. & T. Schlosser Paper Corp., New York.
Schmidt, E. J., Parker, Thomas, Tucker Paper Co., Chicago.
Schoff, C. E., San Antonio Paper Co., San Antonio, Tex.
Schuman, Louis, Manhattan Card & Paper Co., New York.
Schwarz, C. F., Schwarz Paper Co., Lincoln, Neb.
Seinsheimer, Walter, Seinsheimer Paper Co., Cincinnati, Ohio.
Severance, H. J., Hubbs Paper Co., Buffalo, N. Y.
Seyler, A. H., Cleveland Paper Co., Cleveland, Ohio.
Shaw, Charles A., Whitney Bros., Inc., Boston.
Shenock, N., Globe Paper Co., Cleveland, Ohio.
Sherman, John R., Antietam Paper Co., Jacksonville, Fla.
Sielaff, H., A. E., Sielaff Paper Co., Milwaukee, Wis.
Sielaff, R. H., A. E. Sielaff Paper Co., Milwaukee, Wis.
Silverman, Sam, Continental Paper & Bag Corp., Cleveland, Ohio.
Simon, Andrew, Charles Beck Co., Philadelphia.
Simpson, H. J., Hubbs & Corning, Baltimore.
Skinner, Geo. W. L., Skinner & Co., New York.
Slote, Irwin, Sec., Paper Association of New York City.
Smith, J. K., J. & F. B. Garrett Co., Syracuse, N. Y.
Smith, Thos., Louisville, Paper Co., Louisville, Ky.
Smith, Thomas Floyd, Jr., Louisville Paper Co., Louisville, Ky.
Smythe, T. H. B., L. L. N. Smythe Co., Philadelphia.
Spauling, C. A., Carpenter Paper Co., Des Moines, Ia.
Spooner, H. S., Howard Paper Co., Urbana, Ohio.
Stanford, H. R., Stanford Paper Co., Washington, D. C.
Starling, Seaman-Patrick Co., Detroit, Mich.
Stetson, Wm. N. Jr., Storrs & Bement Co., Boston.
Stone, Robert M., Stone, Forsyth Co., Boston.
Strauss, R. I., American Paper Co., Richmond, Va.
Streeter, Chas. L., Swigart Paper Co., Chicago.
Streibert, Henry, Streibert Paper Co., Philadelphia.
Strott, Geo. H., New York Paper Co., Baltimore.
Stuart, W. H., Henry Lindenmeyr & Sons, New York.
Stuhlreyer, P. A., Diem & Wing Paper Co., Cincinnati, Ohio.
Stutzman, Fred, Holland Paper Co., Buffalo, N. Y.
Supple, L. F., Whiting-Patterson Co., Philadelphia.

T

Tayloe, Alfred D., Tayloe Paper Co., Memphis, Tenn.
Tayloe, Geo. G., Tayloe Paper Co., Memphis, Tenn.
Thomas, A. C., F. A. Flinn Inc., New York.
Thomas, Morgan H., Garrett-Buchanan Co., Philadelphia.
Thompson, James, U. S. Envelope Co., Worcester, Mass.
Thurston, H. B., Conrow Bros., New York.
Tobey, S. M., Seaman Paper Co., St. Louis, Mo.
Tracy, F. Bendel, Fort Hill Paper Co., Boston.
Torner, Harry W., Industrial Paper Co., Baltimore.
Tribou, Arthur G., Fort Hill Paper Co., Boston.

U

Utess, R. C., American Mfg. Co., Brooklyn, N. Y.
Unger, M. A., Unger Commercial Co., Cleveland, Ohio.

V

Vandyck, H. A., Chas. F. Hubbs & Co., New York.

W

Waite, Clayton T., John Carter & Co., Inc, Boston.
Waite, Harris E., John Carter & Co., Inc., Boston.
Walsh, John H., Cleveland Paper Co., Cleveland, Ohio.
Walter, Simon, S. Walter, Inc., Philadelphia.
Walton, R. L., D. S. Walton & Co., New York.
Ward, B. W., D. L. Ward Co., Philadelphia.
Warner, K. S., John F. Sarle Co., Inc., New York.
Washburn, H. O., Messinger Paper Co., Chicago.
Weaver, D. J., Henry Lindenmeyr & Sons, New York.
Weaver, J. S., Garrett-Buchanan Co., Philadelphia.
Webb, George L., Storrs & Bement Co., New Haven, Conn.
Weil, Max W., Union Paper & Twine Co., Cleveland, Ohio.
Weiss, A. J., Lowe Paper Co., Ridgefield, N. J.
Wellhouse, Sidney L., National Paper Co., Atlanta, Ga.
Wellington, Roger H., Alling & Cory Co., Rochester, N. Y.
Welsh, John H., Cleveland Paper Co., Cleveland, Ohio.
Werner, D. J., Henry Lindenmeyr & Sons, New Yord,
White, C. P., Chas. F., Hubbs & Co., New York.
Whiteford, Lowell J., Chas. F. Hubbs & Co., New York.
Whitney, H. B., Whitney Paper Co., Wichita, Kans.
Whitney, John R., Meek & Whitney, Inc., Springfield, Mass.
Wiggins, M. V., Crescent Paper Co., Indianapolis, Ind.
Wilcox, A. N., Wilcox-Mosher-Leffholm, Minneapolis.
Wilcox, W. S., Wilcox, Walter, Furlong Paper Co., Philadelphia.
Wilder, C. A., Wilder Bros. Co., Philadelphia.
Williams, F. K., Caskie-Dillard Co., Lynchburg, Va.
Willis, T. F., Willis & Weber Paper Co., Kansas City, Mo.
Wilson, B. W., B. W. Wilson, Richmond, Va.
Wilson, Valentine, S. Walter, Inc., Philadelphia.
Wittrock, C. J., Paragon Paper Co., Cincinnati, Ohio.
Wolbrette, Jules, Southern Paper Co., Ltd., New Orleans, La.
Wolfson, Leon B., Wolfson Paper Co., Columbus, Ga.
Wright, E. E., Miller & Wright Paper Co., New York.

Z

Zellerbach, H. L., Zellerbach Paper Co., San Francisco.
Zellerbach, I., Zellerbach Paper Co., San Francisco.
Zimmerman, J. W., Standard Paper Co., Cincinnati, Ohio.
Zucker, Irving, Oneida Paper Products, Inc., Brooklyn, N. Y.

TO BUILD SULPHATE MILL IN IDAHO

A. T. Peterson, executive vice-president of the Pacific States Pulp and Paper Company, has announced that tentative plans for $2,500,000 of Eastern capital have been developed and that he will leave Spokane for the East at once to close negotiations for financing of a $1,500,000 sulphate pulp mill at Priest River, Idaho. This plant was forecast some months ago but financing has been under way, and early this year the company concluded negotiations for acquisition of large sodium sulphate deposits in Okanogan County, Wash., which completes arrangements for the raw material required in the proposed Priest River mill. To develop these deposits a $150,000 sodium sulphate plant will probably be located about 15 miles north of Wenatchee, Wash.

Contract for all machinery for both the pulp mill and sodium sulphate plant is expected to be arranged while Mr. Peterson is in New York, and at the same time negotiations are expected to be closed with New York and Chicago financial houses for floating $1,500,000 of the company's stock in eastern markets.

Through the negotiations for the sodium sulphate deposits a contract was signed for acquisition of more than 90 per cent of the stock of the Naso Chemical Company which now owns seven lakes containing an estimated immediate supply of 600,000 tons of sodium sulphate. The plant which the company will build will have a capacity of 100 tons of sodium sulphate daily, it is stated.

The proposed mill at Priest River, Idaho, will have a capacity of 100 tons of sulphate pulp daily, and an arrangement has been entered into with the Pulp and Paper Trading Company of New York to market this production on a commission basis and guarantee the payments by them of all accounts of sales.

INTERNATIONAL STAFF CHANGES

Announcement is made that Clinton V. Cassidy will sever his connections as manager of the Corinth, N. Y., plant of the International Paper Company within a few days in order to be transferred to another branch. It is reported that he will be succeeded by another company official from Three Rivers, Canada. Mr. Cassidy came to the local branch from New York several years ago when he displaced Charles W. Walker, now superintendent of the Three Rivers plant. Many changes have taken place at the local plant under the reign of Mr. Cassidy, among these being the adaptation of paper machines to specialty production and an extensive expansion program which is still under way.

While no date has been fixed for the re-opening of the South Glens Falls plant of the company it is said that everything has been placed in readiness for the manufacture of news print paper. Two machines have been overhauled and are now ready for full operations, according to announcement.

WARREN PARCHMENT SETTLEMENT

A compromise settlement with unsecured creditors of the Warren Parchment Company has been effected and under the terms they will receive twenty-five cents on each dollar owed them. The unsecured claims amount to about $202,000 which means a settlement of about $50,000. Officials of the company announced that they were undecided as to just what would be done with the mill in the future.

The settlement with creditors was announced following a hearing before Judge Conboy, referee in bankruptcy, who examined officials of the firm. The unsecured creditors were represented by Charles A. Phelps, of the firm of Phelps & Hudson, and the paper company by Francis Cullen, of Purcell, Cullen & Reynolds. Following the settlement Mr. Phelps said that it was a very fine plan on the part of the paper company as the creditors will receive more than they would if the bankruptcy went through and the assets were liquidated and distributed.

The Warren Parchment Company was organized about nineteen years ago for the manufacture of greaseproof papers. The mill has been idle since last August because of lack of sufficient orders to warrant continued operation.

There is a possibility that the mill will later be converted to the manufacture of some other grade of paper or that it may be disposed of to other interests. The production per 24 hours was rated at about 15 tons.

GIFT TO E. H. NAYLOR

At a meeting of the Tissue Paper Manufacturers Association held on Thursday afternoon, February 20th, at the Hotel Pennsylvania, New York, the retiring secretary, E. H. Naylor, was presented by the manufacturers with a complete solid silver dinner set in appreciation of his fifteen years service as their secretary, and as an expression of warm friendship and high regard which each manufacturer feels toward Mr. Naylor.

Mr. Naylor's resignation was due to the fact that his duties as secretary and counsel of the Writing Paper Manufacturers Association—with whom he has been connected for over sixteen years—have so increased in the last few years as to make it necessary for him to devote his entire attention to the writing and cover paper interests. On this account he asked to be relieved a year ago but was urged by the members to remain a while longer, but last fall his increased work made the resignation imperative, and therefore it was most reluctantly accepted as of February 1, 1930.

Herbert Thwaite, formerly with the Frank L. Scott Company of New York, has been elected to succeed Mr. Naylor.

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THE YEAR IN PAPER

The annual review section of this Convention Number of the PAPER TRADE JOURNAL furnishes, as usual, an excellent cross-section of the pulp and paper industry on the North American continent for the past year. The various sections of the industry have been reviewed by representative men in their particular fields and may be depended upon as being thoroughly accurate and trustworthy. It may be judged from the reviews presented that it has not been in all respects a satisfactory year. It is encouraging to note, however, that the causes for this situation are realized and that determined efforts will be made during the ensuing year to remedy at least some of the adverse circumstances.

Unusual activity has been in evidence throughout the year in practically every branch of the industry. Consumption of paper also has been greater than ever before in the history of the country. It is apparent, however, that the increase in production has been more rapid than the increase in consumption. This, naturally, has produced an unhealthful situation. It has resulted in a great deal of senseless competition and disseminated profits that should have been substantial and gratifying when the great activity of the year is taken into consideration.

Marked improvement has been made in recent years in the technology of pulp and paper making, but it is becoming increasingly apparent that development in the merchandising end has not kept pace with the manufacturing end. This is wrong and an improvement should be made in this department as rapidly as possible.

The year showed a remarkable record in news print. The industry as a whole operated at 84 per cent of capacity and produced on the North American continent a total of almost 4,400,000 tons. Of this amount Canada produced 2,729,000 tons, the United States 1,392,000 tons and Newfoundland and Mexico the remaining tonnage. As compared with 1928, Canada increased its tonnage over 14 per cent, while the United States showed a loss of almost 2 per cent. Consumption not only held its own, but rather unexpectedly showed an increase. If this increase continues, it will, of course, help the situation decidedly as there is less prospective tonnage either from new mills or mill expansions this year than last.

In this connection, it is interesting to note that a new news print mill, that of the Maine Seaboard Company at Bucksport, Maine, will probably come into production during the latter part of this year. This will be a two-machine mill and will add considerably to the tonnage in the United States. It will be the first news print mill built in this country in some years and one of but four, if we recollect correctly, built in the United States since news print was made free of duty in the Taft Administration in 1911. News print prices in general were not satisfactory and were prevented from being more greatly disturbed by the efforts at stabilization of the Federal and Provincial Governments of Canada. Such progress has already been made by some of the great companies in hydro-electrical developments that it is already regarded as somewhat of a twin industry to news print. This movement to power development is likely to continue and in the course of time prove more profitable to the companies engaged in it than the manufacture of paper.

Production continued to keep considerably ahead of consumption in the book section of the industry and the year in consequence was not a very satisfactory one. During the year there was produced, according to estimate, 1,440,000 tons of book paper, the mills running about 83 per cent of productive capacity. This was about 100,000 tons more than in 1928 when the mills were running only about 80 per cent of capacity. Because of over-production, the price situation was unsatisfactory. It is estimated by a usually reliable authority that in consequence, book prices in 1929 were an average of $3.00 per ton lower than in the preceding year. While production during the ensuing year, because of additional machine installations and expansions will probably continue to increase, it is believed that it will more nearly coincide with demand than during the past year. If this occurs, book manufacturers expect to experience a more profitable year than in 1929.

Fine papers, as has been the case for a number of years past, were the most satisfactory section of the industry during the past year. Production was considerably increased over the preceding year, but sales also increased materially. More intelligent merchandising is practiced in this variety of paper than in most others and the generally more satisfactory conditions here are, of course, largely due to this fact. In common with practically all other lines, fine papers suffered recession in demand in December and demand at present continues somewhat below normal. However, a considerable improvement is already noticeable. This improvement is expected to continue. Judging from present indications, demand is expected to be normal by summer and the slack experienced in the early months, it is believed, will be easily made up during the closing months of the year. The total volume of business, it now seems, will at least equal that of 1929, and probably slightly exceed it.

The year in kraft wrapping was unsatisfactory. Production again considerably exceeded demand and competition as a result was exceedingly keen throughout the year. Prices, of course, were low and most mills, if they ended the year with a profit, doubtless made much less than an adequate return on the capital invested. But manufacturers in this section of the market are intelligently engaged in ironing out the numerous difficult problems

that confront them and this should bring about an improvement as time goes along.

The board section of the market also had a less satisfactory year than in 1928, which admittedly was poor. Production was decidedly increased, but consumption also was greater than ever. In spite of this latter fact, prices continued to drift to lower levels. This leads to the conclusion that a decided improvement must take place in the merchandising of the board market before manufacturers can expect to make the profit to which they are entitled. Many difficult problems will have to be solved before this can be accomplished. It is encouraging to know that cooperation is being effected among the representative manufacturers and that as time goes along the board business, which for so many years has been so poorly conducted, will undoubtedly be placed on a more business like basis. This is a consumation that is much to be desired and for the good of the board business it cannot be brought about any too soon.

The reviews for the past year in most cases do not make pleasant reading. It is obvious that the outstanding cause for the lack of greater profits in most branches of the industry during the year has been lack of intelligent merchandising, just as it has been for so many years in the past. In this connection, it is interesting to point out a fact that is commonly realized apparently by everyone but by paper manuafcturers themselves. This is that as a class they take less advantage of the great power of advertising to expand the use of their products than perhaps do the members of any of the other great industries. Yet the consumption of paper, through the enormous growth of advertising, has been more responsible for the development of the paper industry than any other factor. In general, it is probably true that only the fine paper industry has begun to appreciate the value, and made adequate use of this important help in increasing the consumption of paper and this branch for a number of years past has experienced the greatest prosperity of any branches of the paper industry. Paper manufacturers should become better advertisers.

The outlook is not discouraging. The great depression in the stock market in the fall is passing away more rapidly than most well informed persons dared to hope. Already steel, noticeably, and other great industries to a lesser extent are well on the road to a normal condition. From present aspects in most industries now, it appears that the summer months will witness only about the normal recession in business and the fall will see rather active conditions, the year ending with about the same volume of business for the twelve months as was transacted during 1929. Paper suffered less severely during the late fall than most other lines, so it is reasonable to expect that the return to normal here will be rather rapid. Thus the outlook for paper in 1930 may be said to be fair so far as volume of sales is concerned. Profits will be satisfactory, or otherwise, as paper manufacturers correct some of the mistakes of the past few years.

BUCKSPORT NEWS PRINT MILL

In connection with the 240-ton news print mill to be brought into operation in 1931 at Bucksport, Me., by the Maine Seaboard Paper Company, it is stated that pulpwood will be secured from Nova Scotia and New Brunswick. The company's product will be shipped to New York by water, and a steamer is to be built by the company for this purpose.

NEWFOUNDLAND'S PAPER INDUSTRY

Sir Richard Squires, Premier of Newfoundland, who spent several days in Montreal during the week, declared in an interview that Newfoundland was out to develop its pulp and paper industry to the limit. In other words it was prepared to "hew to the line, let the chips fall where they may," and the troubles of Ontario and Quebec in the news print industry were Newfoundland's good fortune.

"So far as I am concerned," he said, "I should like to see Ferguson and Taschereau close every pulp mill in Canada—your trouble will be our good fortune—I want to develop Newfoundland and I am not interested in the name of the man nor the nationality of his money so long as it brings industrial development to Newfoundland."

He continued: "Besides the concessions of pulp already held by the International Paper Company and other companies, there are from 10 to 15 million cords of pulp in another section of Newfoundland, owned by the Reid Newfoundland Company. And I do not know how many million cords there are in Labrador. Some say 60,000,000 and some say 260,000,000.

"We want to develop these resources. And whether it is Abitibi, International, Hearst, Rothermere, or any outstanding company with the necessary capital, we are ready to trade.

"To date, there has been no trading. Newfoundland has been approached by a multitude of people. I have talked to them all but we have never got to the point where any definite decision was made.

"I am ready and willing to talk business to anyone, who will develop the country for us. We have 150,000 square miles of the earth's surface and we think we own something worth having.

"Our financial men in Newfoundland, while willing enough to handle any ordinary industrial development, have not the extreme financial wealth for the purposes of extraordinary development. We need some great company which can finance such a gigantic pulp and paper project.

"I am not interested in the name of the man nor the nationality of the money, so long as it brings industrial development to Newfoundland. The longer that Ontario and Quebec combine to restrict output, the better it pleases me. Ontario and Quebec's trouble is our good fortune."

"Have you talked things over with A. M. Graustein, head of International Paper Company?"

"No, I have chatted with him in New York, but we never discussed any business. I have not talked with any pulp people here. As a matter of fact, my business in Montreal, Ottawa and New York has nothing whatever to do with pulp.

"Down there we have abundant water power and immense national resources. The thing that amazes me is that New York and Montreal are not more interested."

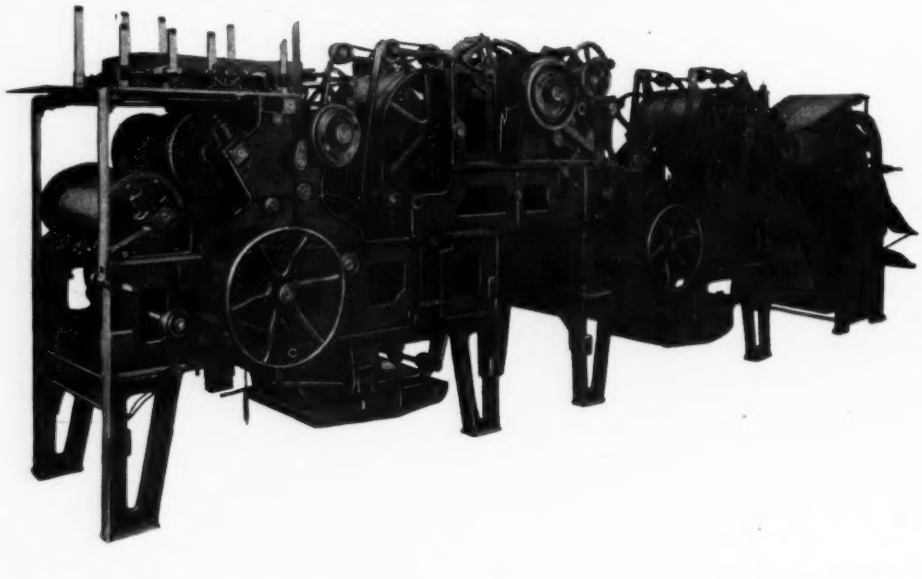
MILL EQUIPMENT FOR MEXICO

A large order just received from paper manufacturing interests in Mexico will keep the Coty Machine Company running at full capacity for some time. The order is for paper mill equipment from the firm of Loreto Y. Pena Pobre in San Angel, D. F., Mexico. The company is reported to control the largest paper interests in Mexico and for some time has been considering the purchase of machinery for making pasted multiwall valve bags. Representatives of the firm recently visited this city and following a demonstration, an option on the desired equipment was given. Just before the option expired the local company received the order from Mexico.

The foreign business of the Coty Machine Company is expected to assume large proportions in the near future as it is reported that the Mexican concern is only one of the many firms negotiating for their high speed equipment. The foreign concerns are reported greatly interested in the latest invention of the local company which turns out a new style patented multiwall valve bag.

ARE YOU PREPARED TO TAKE YOUR SHARE OF THE PASTED MULTI-WALL VALVE BAG BUSINESS

Many large companies now have our high-speed machinery, we are building more, and additional orders are still coming. Can you afford to overlook this field until it is too late to compete on even terms?



The Double Bottomer Unit, with automatic feed, bottoms both ends of multi-wall tubes in one operation at a speed of 100 per minute, so as to produce pasted multi-wall valve bags of from one to five plies. This machine is adapted to bottom either standard bottoms or the new-style patented Coty multi-wall valve bag bottom, which stands as high as 72 four-foot drops. This new bottom provides flexibility and great strength, together with a considerable saving in paper. Such bags are ideal for packing cement, lime, plaster, gypsum, groundstone, and allied products.

This machine will bottom tubes ranging in width from sixteen to twenty inches inclusive, and varying in length from eighteen to forty inches inclusive, the width of either bottom or valve end varying from two and one-half to seven inches inclusive.

Let us write you the particulars of the Double Bottomer Unit shown here, and our Multi-wall Tuber, as well as our regular line of high-speed sack machinery.

COTY MACHINE COMPANY INC.

WATERTOWN, N. Y.

Pennsylvania Paper Mills Extend Production

Despite Prevailing Light Request For Practically All Standard Grades of Paper, Fine Paper Manufacturers Are Increasing Their Output In Preparation For Springtime Demand—Paper Board Plants Have Curtailed Production Materially

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., February 17, 1930.—As the winter months are waning, paper dealers are receiving many inquiries, despite the lagging tendency of buying at this time. Fine paper manufacturers have been gradually extending production. There has been a fairly gratifying amount of business done by the mill representatives who sell in volume to the printing and publishing houses. Competition among dealers grows livelier, particularly where tonnage is concerned. Mill agents are vieing with one another to land orders and while prices are not made destructively low there has been wavering from the steadier values that prevailed with the new year opening. Manufacturers of fine paper specialties state that orders are growing and operations expanding although production is not on capacity schedule. Paper board quotations are low, the prices being from $32.50 to $35.00 for chip and from $37.50 to $38.50 for news; straw board being $52.50 and mist gray and tan chip board now quoted at $47.50. There has been little tonnage available to the manufacturers as the consumers appear to be well supplied with board purchased last Fall at low prices. Manufacturers have considerably curtailed operations pending more stabilized mill conditions.

Wrapping paper dealers have been concentrating on the specialty market as the standard grades are drifting along. Krafts are listless stocks, but inquiries are frequent for prices for future deliveries so that activity is looked for shortly in preparation for spring. There has been little mill canvassing here for orders since the reduction a few weeks back and tonnage sufficient to maintain operations for the time being no doubt has been secured in line with the price adjustments of the manufacturers. Absence of further mill offerings indicates a satisfactory volume of business as having been secured, the dealers state. Cellophane and food products, wraps and bags with combinations of paper and cellophane, and fiber containers with cellophane faces, have been highly active this season as the novelty of these specialties grows in favor with such producers. The general bag market, while not active, is firmer.

Though the box board industries are quieter, there has been full time operation of mills with large national patronage where board and containers are both produced. Such concerns as the Kieckheter Container Corporation, of Delair, N. J., and the Hinde and Dauche Mills at Gloucester, N. J., are running full time in both the board manufacturing and the container producing departments. All of the boards manufactured by these concerns are for consumption in the converting divisions. These mills are now the main buyers of common grades of paper stock at this time. Binder board manufacturers in the Downingtown District of Pennsylvania are also on full time schedule with steady demand.

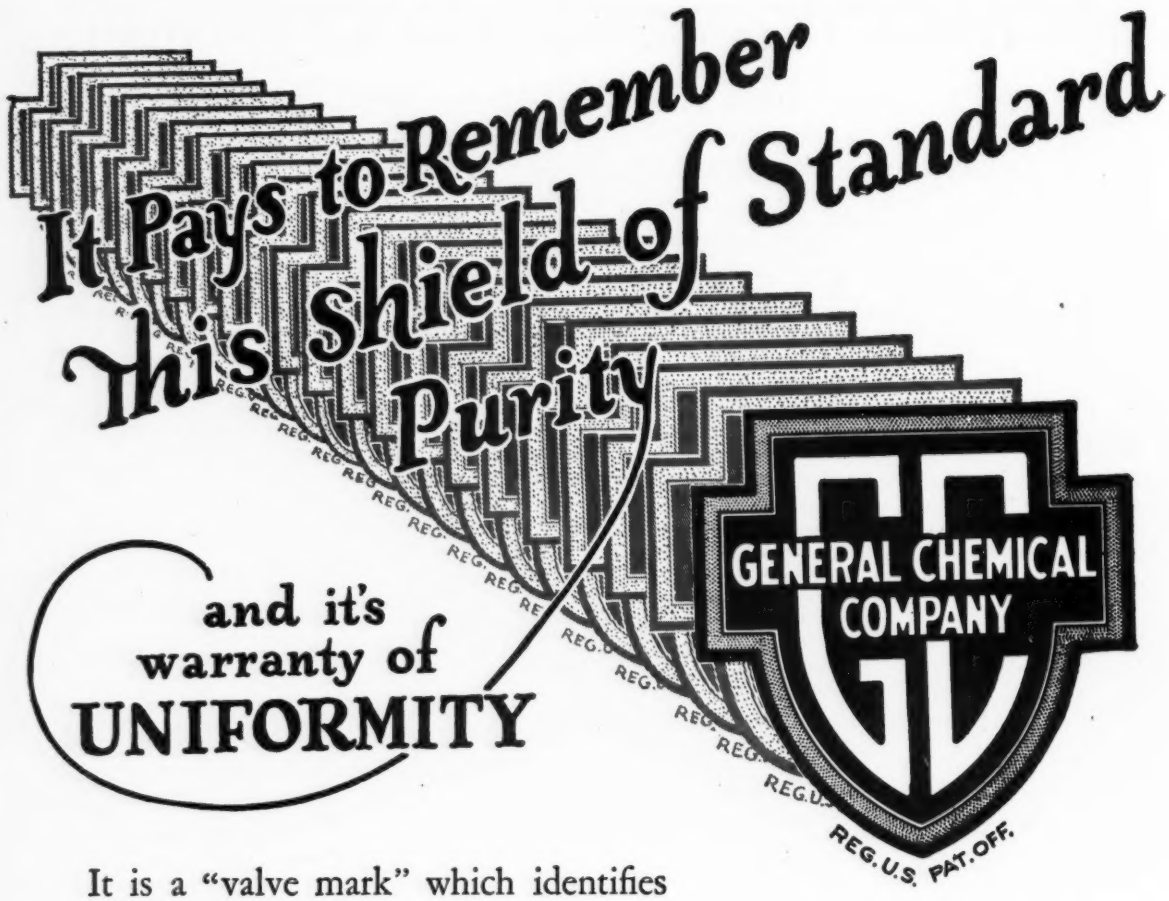
Paper and Cordage Association Frolic

Members of the Philadelphia Paper and Cordage Association will join in the annual frolic which is to be held on Washington's birthday at the Hotel Pennsylvania. There will be a combined entertainment of the annual banquet and dinner dance with the membership participating and extending the hospitality of the evening to the fair sex. Sixty associates and their guests will join in the program. Special favors will be given at the dinner table while gifts will be distributed during the course of the entertainment. There will be a preliminary meeting of the members at the Adelphia Hotel, February 21, when the members will conduct the usual monthly business and hear an educational talk on credits given by John E. Norwell, of the Credit Interchange Bureau of the National Association of Credit Men. His subject will be "Retail Credit."

National Paper Box Convention

Local executives of the National Paper Box Manufacturers' Association with headquarters in the Liberty Building, will journey to Cleveland next week to participate in the 12th Annual Convention and Trade Practice Conference which will be held at the Cleveland Hotel February 26, 27, and 28. February 27 will be devoted to Trade Practice Conferences of the set-up paper box industry, paper can and tube and drum industries. Paul Brunt, executive vice-president of the Container Corporation of America, paper board and container manufacturers, will address the members on trade practices and sales promotion. Exhibitions of the paper box supply trade to be held in the Cleveland Hotel will include a large number of paper manufacturers and distributors catering to the allied trades. There will be a beefsteak dinner on Wednesday evening, February 26, given through the courtesy of the National Paper Box Supplies Association followed by an entertainment and dance. The Hon. E. A. McCulloch, of the United States Federal Trade Commission, will preside at the Trade Practice Conference. The following paper concerns will join in the convention and exhibits as associate members of the National Association:

American Coating Mills, Elkhart, Ind.; American Lace Paper Company, Milwaukee, Wis.; Beekman Paper and Card Company, New York; Blackstone Glazed Paper Company, Pawtucket, R. I.; Box Board and Lining Company, 10 Grand street, New York; Chesapeake Paperboard Company, Baltimore, Md.; A. M. Collins Manufacturing Company, Philadelphia; Thos. E. Collins & Co., St. Louis, Mo.; Container Corporation of America, Flat Rock road, Manayunk, Philadelphia; A. S. Datz & Son, Philadelphia; Louis Dejonge & Co., New York; District of Columbia Paper Manufacturing Company, Washington, D. C.; Domestic Mills Paper Company, New York; Downingtown Paper Company, Downingtown, Pa.; Harry J. Fackiner, New York; Charles T. Forster, Container Corporation of America, Chicago Coated Board Division, Chicago, Ill.; Robert Gair Company, Boston, Mass.; Gosling & Farr, Inc., New York; L. F. Grammes & Sons, Inc., Allentown, Pa.; Graphic Arts Company, Buffalo, N. Y.; Hampden Glazed Paper and Card Company, Holyoke, Mass.; A. Hartung & Co., Philadelphia; J. F. Helmold & Bro., Inc., Chicago, Ill.; R. R. Heywood Company, Inc., New York; Hughes & Hoffman, New York; John Jacques & Son, Worcester, Mass.; Keller-Dorian Paper Company, Inc., New York; The LaBoiteaux Company, Cincinnati, O.; Lawless Bros. Paper Mills, Inc., East Rochester, N. Y.; McLaurin-Jones Company, Brookfield, Mass.; MacSim Bar Paper Company, Otsego, Mich.; Manchester Board and Paper Company, Richmond, Va.; Matthias & Freeman Paper Company, Philadelphia; Middlesex Products Company, Boston, Mass.; Mid-States Gummed Paper Company, Chicago, Ill.; Nashua Gummed and Coated Paper Company, Nashua, N. H.; National Coated Paper Corporation, Pawtucket, R. I.; New England Card and Paper Company, Inc., Springfield, Mass.; Orchard Paper Company, St. Lewis, Mo.; Paper Service Company, Philadelphia; Samuel R. Parry, Rochester, N. Y.; Pawtucket Glazed Paper Company, Inc., Pawtucket, R. I.; Peapack Paper Company, Peapack, N. J.; Pinco Papers, Inc., Camden, N. J.; The Queen City Paper Company, Cincinnati, Ohio; Rexford Paper Company, Milwaukee, Wis.; Philip Rudolph & Son, Inc., Philadelphia; Springfield Glazed Paper Company, Springfield, Mass.; Stein, Hall & Co., Inc., New



It is a "valve mark" which identifies and distinguishes every product of General Chemical Company. Today, as for years past, it stands as a warranty of uniformity in the product which reaches you in the container bearing this shield. It protects you against variations in quality. It enables you to standardize your processes. It is your guarantee of value.

General Chemical Company's principal products include:

Sulphuric Acid
Nitric Acid
Muriatic Acid
Sodium Sulphide
(Chip Patented)
Acetic Acid
Glauber's Salt
Aluminum Sulphate
Disodium Phosphate
Tri Sodium Phosphate
Anhydrous
Bisulphite Soda
Baker & Adamson Quality
C. P. Acids and Reagents
Insecticides and
Fungicides

GENERAL CHEMICAL COMPANY

40 RECTOR ST., NEW YORK

CABLE ADDRESS, LYCURGUS, N. Y.

BUFFALO
CHICAGO
CLEVELAND
PITTSBURGH
PROVIDENCE
DENVER
ST. LOUIS
THE NICHOLS CHEMICAL CO., LTD., MONTREAL
LOS ANGELES
PHILADELPHIA
SAN FRANCISCO

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York; United Paperboard Company, New York; Waldorf Paper Products Company, St. Paul, Minn.; Walther & Co., Inc., Brooklyn, N. Y.; C. R. Whiting Company, Inc., Newark, N. J.; Whiting-Patterson Company, Inc., Philadelphia; Chas. W. Williams & Co., Inc., New York.

Paper Trade Association Meets

Concerned chiefly with the coming national convention and the program which will be held this week, the Philadelphia Paper Trade Association, Fine Paper Division, met at the Down Town Club, in the Public Ledger Building, and there discussed problems of national importance and those that will directly concern the local industry. President W. S. Wilcox, of the association, and of the firm of Wilcox Walter Furlong, presided. Norbert A. Considine, of the Paper House of Pennsylvania, will represent the local Fine Paper Division as delegate to the National Convention, while Charles Wilder, of Wilder Brothers, is delegate from the Wrapping Paper Division.

Typothetae Views Graphic Arts Exhibit

The assembly of the fifty best pieces of direct mail advertising matter which is garnered under direction of the D. L. Ward Company, fine paper distributors, 28 South 6th street, was exhibited at the Poor Richard Club and a survey of the 1929 campaigns as they were given throughout the series of the year explained to the members of the Typothetae Sales Club last Tuesday.

Paper Trade-Typothetae Meetings

There will be a series of interesting annual meetings of the combined printing and paper trades and supply industries to be held this year, a list of which just has been sent out by the Paper Trade Association and the Philadelphia Typothetae. They are the grand annual frolic of the combined industries to be staged as Graphic Arts Night, on March 6, at the Benjamin Franklin Hotel; the Third District Typothetae Convention, May 16 and 17 at the Penn Harris Hotel, Harrisburg, Pa., and the United Typothetae Convention, October 13 to 16, to be held in Boston.

Piqua Strawboard Co. To Close Local Office

The local offices of the Piqua Strawboard Company will be closed after March 1 when all local business will be transacted from the Piqua, Ohio, headquarters. The local offices have been conducted under the management of the Chicago branch since the death of J. F. Chism, whose sudden passing occurred last December. The offices in the Drexel Building will be discontinued and the Eastern Sales District consolidated with the main headquarters and sales department. The territory will be represented by representatives working directly from the plant headquarters instead of through a Philadelphia manager as heretofore, and will be covered periodically by a traveling salesman. Orders for straw board for Eastern consumption will be executed directly through the Ohio offices.

Philip Carey Mfg. Co. Buys Local Land

A site adjoining the plants of the U. S. Gypsum Company and several large oil concerns, has been acquired by the Philip Carey Manufacturing Company, for the erection of a plant to be devoted to the production of roofing compounds, roofing papers and combination products. The plant is to be erected on a plot of ground with 300 feet along the Schuylkill River and with a depth of 1,000 feet at the junction of 58th street and the river. The price paid for the property was $224,455.

M. H. Thomas Matched With Babe Ruth at Golf

Just returned from Florida, where he has been sojourning for the past fortnight, President Morgan H. Thomas, of the Garrett-Buchanan Company, is being congratulated on his excellent playing on the golf links at St. Petersburg, where he was matched with the doughty King of Swat, Babe Ruth, and despite the prowess of the latter came out with a good record. To show the "Home Folk" just where he stood with the Invincible Babe, President Thomas brought his score card autographed by the baseball star, and this is now found among the treasures at the office of the G-B Company.

Simon Walter Back From West Indies

President Simon Walter, of S. Walter, Inc., 142 North 5th street, returned from a tour of the West Indies and Panama in time for the National Convention, and will stop over in New York to join in the yearly meeting of the trade before making the homeward trip.

John J. Costello Removes

The rag and paper warehouse of John J. Costello, formerly located at 48 North Front street, has been removed to larger quarters at 224 Chestnut street. The Costello firm is engaged in the importing and sale of domestic rags in wholesale and was established two years ago. The head of the firm, John J. Costello, was formerly manager of the Penn Paper and Stock Company, having served in that capacity for five years, previous to engaging in business on his own account. In the Chestnut street quarters new equipment for the baling, sorting and packing of rags and paper stock has been installed and the warehousing facilities extended.

COL. E. M. IRISH RETIRES

An outstanding feature of the annual meeting of the Bryant Paper Company, Kalamazoo, Mich., was the retirement of Col. E. M. Irish as a director of the company. He prepared the original incorporation papers of this concern back in 1894 and has since that date been the corporation's legal adviser and legal counsel. Advancing years and poor health caused him to announce that he could no longer serve in that capacity. Out of respect to his wishes, his name was withdrawn and Frank E. McAllister, president of the Kalamazoo Railway Supply Company and a director in the Home Savings Bank, was named to fill the vacancy.

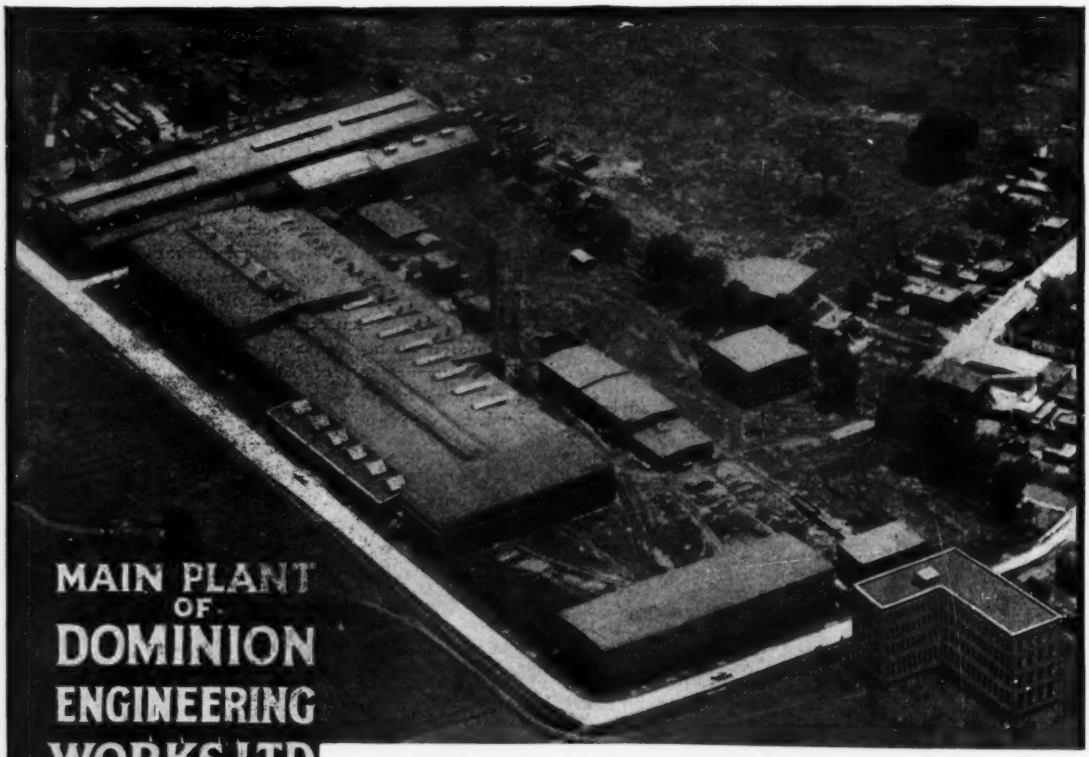
At the same time the stockholders increased the board from ten to twelve in number and elected as new directors, W. J. Lawrence, of Kalamazoo, and Dr. Rudolph Gilkey, of Plainwell. The nine directors re-elected were W. B. Milham, Felix Pagenstecher, J. E. Brown, F. M. Stephens, Vernon T. Barker, Charles Clarage, Glen S. Allen and C. Allen Fox, all of Kalamazoo, and E. L. Brooks, of Cincinnati.

Over 400,000 of the 500,000 shares of common stock outstanding were represented at the meeting. The annual report, recently submitted to the stockholders by President Felix Pagenstecher, was considered and favorably commented on. Dr. L. H. S. DeWitt offered a resolution approving of the progress made in improving the plant and commending the efforts of the officers and directors which has made this progress possible "under adverse and discouraging conditions over which they had no control." This resolution was adopted unanimously.

At the directors' meeting, all officers were re-elected as follows: President, Felix Pagenstecher; vice president, W. B. Milham; secretary-treasurer, A. Allen Fox. F. M. Stephens, sales manager, was also advanced to the post of vice president.

FAREWELL TO W. L. NIXON

William L. Nixon, formerly vice president and manager of production, coarse paper mills of the American Writing Paper Company, Inc., was given a farewell and testimonial dinner at the Hotel Nonotuck Saturday night and presented with a testimonial engraved with the names of each of the 75 of his associates present and also presented with a costly Hamilton wrist watch. The presentation was made by Sidney L. Willson, president of the company, who spoke in laudatory terms of Mr. Nixon's loyalty, efficiency and ability. There was a program of music and dancing by two professionals. Mr. Nixon is to leave soon to take a position and vice president and general manager of the Moore & White concern at Philadelphia, nationally known manufacturers of paper mill machinery.



I. P. MORRIS AND PELTON HYDRAULIC TURBINES

PAPER MAKING
and
HYDRAULIC MACHINERY

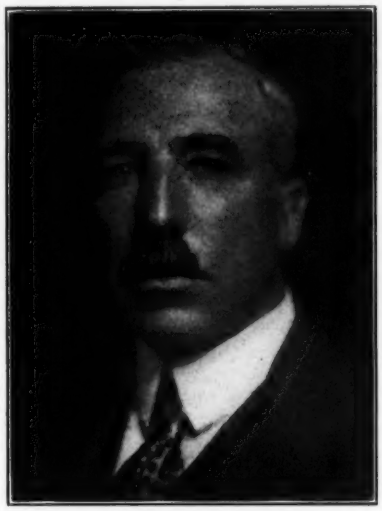
DOMINION ENGINEERING
MONTREAL Works Limited CANADA

Ontario Paper Mills Only Moderately Active

Manufacturers Are Well Caught Up On Their Orders, Generally Speaking, With Little Tonnage In Sight—Book, Bond, Ledger and Fine Paper Plants Experience Light Demand—Coarse Papers Less Active Than In Corresponding Period Last Year

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., February 17, 1930.—Small quantity buying and a general policy of caution as to commitments have characterized the wholesale paper market in Ontario since the year opened. Business conditions generally throughout the province are not conducive to activity in any line and the paper industry is no exception to the rule. The holding back of wheat by the Wheat Pool in the West, Government investigation of stock market operations and somewhat weak conditions on the stock exchanges are



HAROLD CRABTREE
PRESIDENT-ELECT CANADIAN PULP AND PAPER ASSOCIATION

all having their effect on the volume of business and in some quarters a quiet Spring is anticipated. Others predict that before another month passes the tide will have turned and the wholesale paper trade be back to normal again with a steady stride towards really good business in the spring and summer months. Just now, however, none of the paper consuming sources are buying beyond immediate requirements. The printing trade is none too busy and for the most part confines its purchases to the jobs in hand. There are fairly satisfactory sales of paper to the publishing and direct-mail houses but many of these are direct from the mill accounts and do not come through the jobbing houses.

Paper manufacturing circles have also been affected by the general quiet period, although it must be said that one of the largest book paper mills in the province reported this week that they were doing an unusually good business in the Canadian West and were shipping more paper to the western provinces than they were at this time last year. Generally speaking, however, it seems to be true that the paper mills are pretty well caught up to their orders and have none too much tonnage in sight. Most of the mills manufacturing book, bonds, ledgers and fine papers as a whole find that business is coming with disappointing slowness while at the same time pointing out that conditions are seasonal and that the spring influence is hardly due as yet on the general business situation. The wrapping paper trade is inclined to be slow and coarse papers generally are not moving as actively as they were at this time last year. Manufacturers of grease proof, waxing and glassine lines should be booking larger orders than are coming their way now, while on the other hand a fairly satisfactory volume of business is being done in the light weight paper field. Tissues, toilets, fancy crepes, towels, napkins, etc., are moving quite well and the mills are busy. The paper converting end of the paper industry could do with a greater volume of business but envelope manufacturers and manufactured stationery plants are optimistic that the spring is going to be a normal one with them. No one in either manufacturing or paper distribution circles is looking for big business this spring but there is a general feeling of confidence that with the passing of winter a good buying movement will replace the present somewhat inactive conditions in the paper trade generally.

Paper Box Trade Optimistic

A generally optimistic view was taken of the outlook for the paper box industry at the annual meeting of the Toronto Carton Council and associate members held at the King Edward Hotel a few days ago at which paper box manufacturers from various points in Ontario and Quebec were present. It was agreed that 1930 had opened somewhat quietly; that 1929 produced about the same amount of business as the previous year, and that while the outlook for the present year did not promise the output of the last two years, yet the industry was sound basically. The probability is that 1930 will be one of consolidation rather than expansion, according to the consensus of most of the delegates. At the meetings, which were presided over by R. K. Northey, of the Telfer Paper Box Company, addresses were given by Mr. Northey, G. M. Hobarth, of the Sommerville Paper Box Company, London; and J. J. Small, president of the Canadian Paper Box Manufacturers' Association. Brief reports of the year's activities were presented by Alan Manchester, the retiring president; F. W. Fisher and C. V. Hodder, the secretary of the organization. Election of officers resulted in the placing in the chair for the ensuing year of G. B. Reid, of the Ontario Paper Box Company, Toronto, and Mr. Hodder was re-appointed secretary.

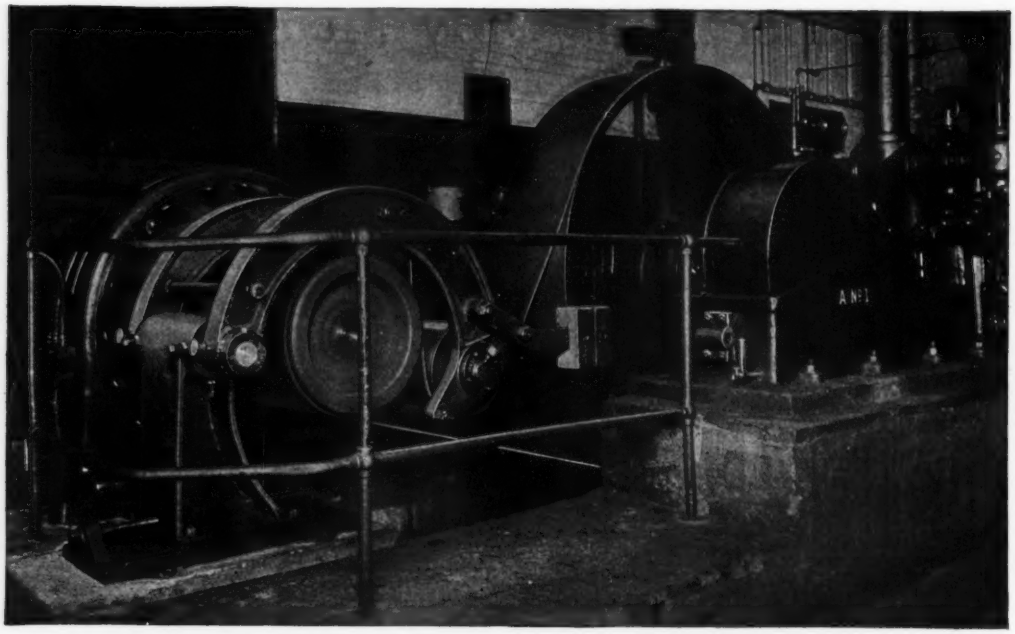
In the evening the members and ladies of the Council sat down to a banquet at which an excellent entertainment was provided and this was followed by a bridge tournament, the successful contenders being Mrs. Feldcamp, Mrs. Luke Morrison and R. A. Dunlop, of the Dominion Paper Box Company.

Convention to be Held in Quebec

Co-incident with the meeting of the Toronto Carton Council the directors of the Canadian Paper Box Manufacturers' Association met and took up the question of this year's annual convention. It was decided to stage the affair at the Chateau Frontenac in Quebec City, June 16 and 17. Tentative plans call for a foregathering of delegates from the Eastern States and Canada in Toronto on Saturday afternoon, June 14, when the whole party will proceed by boat across the lake, down the St. Lawrence, taking in the Saguenay trip and arriving in Quebec City on the morning of the 16th. The delegates from the Montreal district will gather at Montreal and will be joined en route by the eastern delegates. Committees will now get to work on the program which is already partially arranged and provides an equal distribution of business and entertainment.

Big Paper Plant for Hull City

E. B. Eddy Company, Ltd., Bridge street, Hull, has been granted a fixed assessment of $4,000,000 for ten years by the Hull City



Hundreds of compressors are LENIX equipped. Installations are going on right along. Note in this case how great an arc of contact is provided. *This means power.*

The LENIX
Puts Dollars In Your Pocket

YOU pay a certain price for your LENIX but this cost is much more than offset by the savings.

You can save on the length of belting—and probably on the width and ply. You can save in building space as the LENIX gives you maximum drive efficiency in the smallest space.

You can save on the motor by using two-bearing units if the rating is around 300 H.P. or less. You can save by buying a high-speed, less expensive motor or generator as the LENIX permits the use of greater pulley ratios.

You can save in power by going in one jump from very low to very high speeds or vice versa. You can save in belt replacements because the LENIX protects the belt and prolongs belt life. Maximum power is transmitted with minimum belt tension, automatically maintained.

It has been definitely proven that any uniformly thick, extra flexible belting will give long and satisfactory service. Let the LENIX put money in your pocket. Install it on every drive in your plant.

F. L. SMIDTH & CO.

Engineers Incorporated 1895

225 Broadway, New York

The LENIX Drive

REG. U. S. TRADE MARK

Council. If decision of the council is sanctioned by the Legislature tenders will be called shortly afterwards for erection of the proposed alterations and addition to plant to cost more than $1,000,000. The new unit will be for the manufacture of paper and will be located at the end of Hotel de Ville street.

Will Combat Over-Production

Over-production in the paper board industry, which has affected Canadian Paperboard Company, Ltd., to the extent of passing its preferred dividend, is being met by a concerted effort on the part of the manufacturers. A move to stabilize conditions was undertaken last year and the fruit of this co-operation should improve the situation of the company in its next fiscal year which begins in April. There is no doubt that the financial statement for the current year which ends March 31 will reveal lower profits. Competition in the paper board market has been keen and the market has had difficulty in absorbing the increased tonnage which has been brought into production. In addition to greater output in Canada, imports from the United States have added a further burden to the load carried by the Canadian manufacturer. Uncertain conditions prevailing in the United States during 1929 board market made it difficult to reduce the imports of board into Canada, though every effort was made to combat this situation. On the other hand, consumption is gradually growing and it is expected that this will continue. The future, therefore, appears to lie in the ability of the market to absorb tonnage with a subsequent reduction in the spread between supply and demand. The spread between these two factors and the resulting price was reflected in Canadian Paperboard's report for the year ended March 31, 1929. Sales were higher than those of the previous year by $173,000 and amounted to a total of $1,950,774, but net income fell to $255,820 as compared with $287,826. It is admitted that a factor in this decline may be attributed to difficulties in connection with getting the Toronto plant under production. This was first turned over late in 1928 but did not get into its stride till the beginning of April, 1929. Thus the current fiscal year has witnessed a full twelve months operation of the 100 ton unit, but any benefits accruing from its operation have been offset by conditions which have prevailed in the paper board market. The total capacity of the company's plants amounts to 220 tons daily, comprising 45 tons from the Montreal mill; 30 tons from the Campbellford plant and 45 tons from Frankford. The Campbellford unit has been closed down for over a year but may be reopened shortly.

Notes and Jottings of the Trade

The engineering department of the Abitibi Power and Paper Company, Ltd., moved into its new quarters in the head office building of the company at Toronto a few days ago. The personnel of the department includes H. J. Buncke, chief engineer; H. O. Brown, chief draughtsman; G. J. Goldsborough, R. W. Stearns, L. E. Kendale, M. McGregor, F. O'Hara and L. Goodale.

Many friends of the paper trade in Toronto regretted to learn of the death of William Gorman, formerly of the Montreal sales department of Provincial Paper, Ltd., who passed away suddenly from pneumonia after a few days' illness. He was widely known and esteemed in paper circles both in Ontario and Quebec.

A visitor to Toronto a few days ago was J. O. McKerrow, of North Bay, Ont., traffic manager of the Abitibi Power and Paper Company.

With roofing partly finished and plastering to start, additional contracts have been let in connection with the building of the new plant at Peterboro for the Robert Martin Corrugated Paper Box Company.

Miss Eileen Battle, of Thorold, Ont., has just returned from a trip to England, where she was sent to christen at Hull the Ontario Paper Company's boat *Thorold* after having won a personality contest staged by the company.

Among the visitors to Toronto during the past week were E. C. Stovel, of the Stovel Company, Winnipeg; D. D. Harne, sales manager of the Hudson Paper Company, Ltd., Winnipeg, and George Wilson, of Clarke Bros., Ltd., Winnipeg.

USES FOR CELLOPHANE EXPANDING

The latest advances in the use of Cellophane for packaging and wrapping gift articles were shown in a window display during the holiday shopping season at the du Pont Products Exhibit on the Boardwalk at Atlantic City. Products of thirty-nine companies were featured. All of the articles shown were wrapped in Cellophane in many new and attractive ways which have been developed during the past few months.

The gift articles shown included cigars and cigarettes, playing cards, golf balls, razor blades, roulettes, book jackets, toilet articles, boxes of sachet and soap, wearing apparel such as shirts, pajamas, garters, stockings, handkerchiefs and gloves, towel sets and other household linens, candy, glaced fruit, fruit cakes and other food dainties, greeting cards, baby gift boxes, dolls and other gift items.

The companies represented were as follows: Joseph Knecht, U. S. Playing Card Company, Rheinstrom Brothers and the Norwood Company, Cincinnati, Ohio; H. Fendrich, Inc., Evansville, Ind.; Parke, Davis & Co., Detroit, Mich.; National Tinsel Company, Manitowoc, Wis.; Wamsutta Mills, New Bedford, Mass.; McCallum Hosiery Company, Northampton, Mass.; Wm. Carter Company, Needham Heights, Mass.; A. M. Davis Company, Rustcraft, Gillette Safety Razor Company and the Geo. Frost Company, Boston, Mass.; the Mennen Company, Newark, N. J.; James S. Kirk & Co., Chicago, Ill.; Herman Specialty Manufacturing Company, Canton, Ill.; the Smithfield Company, Inc., Smithfield, Va.; S. F. Whitman & Son, Inc., Sibson & Stern and the Rainbow Favor and Novelty Company, Philadelphia, Pa.; Scala Packing Company, Utica, N. Y.; Geo. P. Ide & Co., Troy, N. Y.; Will & Baumer Candle Co., Syracuse, N. Y.; Fownes Bros. & Co., Gloversville, N. Y.; and the Consolidated Cigar Corporation, Cannon Mills, Pepperell Manufacturing Company, P. Lorillard Company, Louis Sherry, Inc., U. S. Rubber Company, National Biscuit Company, Ward Baking Company, Manhattan Shirt Company, National Embossing Company, E. P. Dutton & Co., Excello Shirt Company, F. E. Fonseca & Co., Miro Dena, Inc., New York City.

TO BUILD POWER PLANT

The Michigan Paper Company, with plants in Plainwell and Kalamazoo, Mich., is now working out plans for the erection of a very fine power plant, which when completed will call for a layout of about $350,000. It has been decided to build on the unit system, two units to be erected at once. Engineers are now preparing plans for this work.

At the annual meeting reports for 1929 were highly satisfactory. Earnings for 1929 showed a material increase over 1928 and the outlook for the next twelve months is good. The coating division at Kalamazoo has worked full time for several months.

In the election of directors, a new name, that of L. H. Kirby, Kalamazoo, was added to the list. Other directors are: W. J. Lawrence, H. C. Jackson, Kalamazoo; George W. Gilkey, Clare Wagner, H. J. Mesick, O. O. Stone, Plainwell; E. W. Stone, Allegan and Henry Pelgrim, Holland. G. W. Gilkey is president, general manager and treasurer; Clare Wagner, vice president and assistant general manager; H. C. Jackson, attorney, and Carl Handy, secretary.

A. W. PRIEST LEAVES $840,000

An estate of $840,000 was left by Albert W. Priest, pioneer paper manufacturer of Appleton, Wis., who died on February 5. Because of the death of his wife a month earlier, practically the entire amount goes to nephews and nieces of the decedent. Mr. Priest was the principal owner of the Outagamie Paper Company, of Kaukauna, Wis., up to the time of its sale recently to the Patten Paper Company, Ltd., and also was president of the Hayton Pump and Blower Company, of Appleton, Wis., and of industrial concerns in other lines. He was not actively engaged with any of these concerns at the time of his death.

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Method of procedure for adoption of official paper testing methods by the Technical Association of the Pulp and Paper Industry. The work on standardization of paper testing methods is divided as follows: Microscopical, Physical, Chemical, Optical, Tests for Special Uses of Paper.

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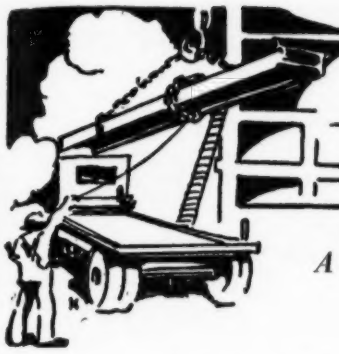


CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Erie, Pa.—The H. F. Watson Paper Company, Erie, is considering the erection of a new addition to its plant on Holland street, to provide for considerable increase in present capacity. Size and details will be determined at an early date. The expansion is reported to cost close to $175,000, including equipment.

Eugene, Ore.—The Pacific Paper Products Company, recently organized with a capital of $500,000 by A. A. Rogers, president of the First National Bank, Eugene, and associates, has secured a tract of land near the city limits of Eugene, fronting on the Coos Bay Branch of the Southern Pacific Railroad, and plans early construction of a new pulp and paper mill. It will consist of several units, equipped for an initial capacity of about 10 tons per 24 hours, and is reported to cost in excess of $400,000, with machinery. P. J. Lamoureaux, Portland, Ore., will be an official of the company, and will be manager at the mill.

Los Angeles, Cal.—The Los Angeles Paper Box Company, 3324 South Main street, has completed plans for its proposed new plant at 2615 Pitt street, and will proceed with superstructure at an early date. The new unit will be one-story, 150x200 feet, and is reported to cost close to $70,000, with equipment. It will provide for large increase in present output.

Chicago, Ill.—The Cromwell Paper Company, 4801 South Whipple street, has completed plans and is arranging an early call for bids for a new addition to its plant, to be one-story, estimated to cost close to $60,000, with equipment. A. Epstein, 2001 West Pershing road, Chicago, is architect and engineer, in charge.

Royal Oak, Mich.—The National Fiber Products, Inc., recently organized with a capital of 25,000 shares of stock, no par value, is said to be planning early operation of plant in this vicinity for manufacture of line of fiber products. The new company is headed by Harry W. Jones, 521 Washington Square Building, Royal Oak, Detroit. Cecil F. Layher, Detroit, is also interested in new organization.

Houston, Tex.—The Paper Supply Company, Preston and Smith streets, has approved plans for the immediate erection of a new storage and distributing plant at Texas street and Broadway, to be one-story, 125x150 feet, reported to cost about $30,000. A building permit has been issued. General contract for the structure has been awarded to Parker Brothers, Inc., 1917 Main street, Houston. L. R. Carroll is president.

Boston, Mass.—The Flintkote Company, Park Square Building, Boston, manufacturer of roofing papers, etc., is said to have plans under consideration for the erection of a number of new plants, to be operated by the company or by interests which have secured licenses to manufacture under the patents of the Flintkote organization. The different units are projected at Los Angeles and Artnez, Cal.; New Orleans, La.; and Chicago, Ill. Estimated cost has not been announced.

Boston, Mass.—The Perkit Folding Box Company has been chartered under state laws with a capital of 200 shares of stock, no par value, to take over and operate the company of same name, with plant at 142 G street. It is understood that a general expansion program will be carried out by the new organization, which is headed by Charles E. Perkit as president, and Edward M. Perkit, treasurer.

Gloucester, N. J.—Fire, February 13, damaged a portion of the local paper mill of the Lang Company, Charles and Water streets, which removed its plant to this location from Philadelphia, Pa., a number of months ago. An official estimate of loss has not been announced. The damage will be replaced.

Minneapolis, Minn.—The Backus Brooks Company, Builders' Exchange Building, Minneapolis, operating the Minnesota and Ontario Paper Company, International Falls, Minn., manufacturer of insulating board products, is said to have concluded arrangements for purchase of a tract of land near Helsingfors, Finland, as site for new mill for manufacture of similar products as produced at the Minnesota plant noted. The new mill will consist of several units and will be equipped for an initial capacity of about 8,500,000 feet per month. It is reported to cost in excess of $2,500,000, with machinery. The plant will be used to furnish the growing demand for the insulating board products of the company from foreign countries.

Chicago, Ill.—The United Paper Mills, Inc., Chicago, has arranged for a special meteing of stockholders on February 24, to approve an increase in capital from 75,000 to 80,000 shares of stock, no par value, a portion of the proceeds to be used for general expansion.

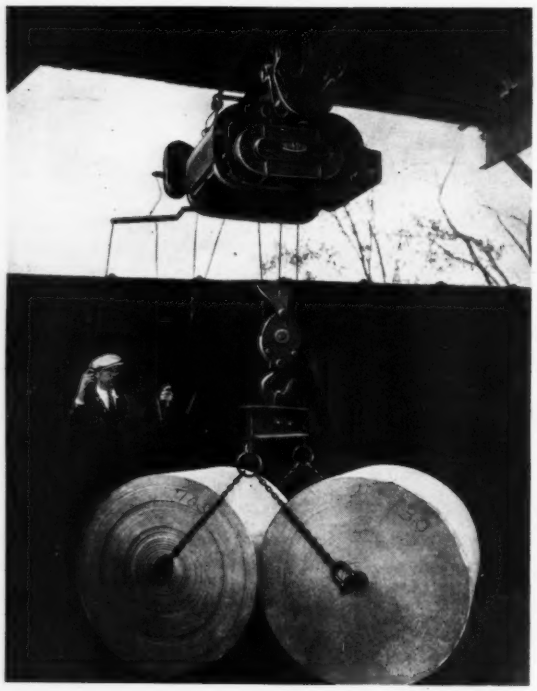
Middletown, Conn.—W. S. Miller, Inc., recently organized under state laws with a capital of $55,000, will take over and expand the local factory of W. S. Miller, specializing in the production of folding paper boxes, setup paper boxes, etc. The new company is headed by W. W. and R. S. Miller, both of Middletown.

Long Island City, N. Y.—The Lily-Tulip Cup Corporation, 122 East 42nd street, New York, manufacturer of paper cups, plates, and similar specialties, is carrying out an expansion program for increased capacity. Considerable additional equipment recently has been installed at the plant, and other machinery will be placed in service in the near future. The plant is running at a capacity schedule. Henry Nias is president.

Cincinnati, Ohio—The Formica Insulation Company, 4614 Spring Grove avenue, is operating on regular full time production schedule, with full working force, and is said to be planning to continue on that basis for an indefinite period.

Camden, N. J.—The S. M. Langston Company, Sixth and Jefferson streets, manufacturer of paper box-making machinery, has completed plans for a new addition to its plant, to be two-story, 50x100 feet, reported to cost close to $50,000, with equipment. Increased capacity will be carried out. General building contract has been let to Fearn & Vogtlin, 222 North 41st street.

Vancouver, B. C.—The Pacific Mills, Ltd., Standard Bank Building, Vancouver, has plans maturing for the erection of a new plant on Burrard Inlet, to be equipped primarily for the treating of paper for wrappers and kindred service. The initial unit is reported to cost about $175,000, with equipment, and will be pro-



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To Members of the 53rd.....

GREETING!

It gives us great pleasure to add our welcome to the chorus of congratulations on this — the 53rd Annual Convention of the Association !

It is, indeed, a notable event, signaling the beginning of another year in the life of this most important group in the industry.

The splendid progress made during the past is a testimony to the loyalty and efficiency of the men of this Convention, since no industry can be greater than its leaders.

Accept again our congratulations with best wishes for the continued success of the Association and its individual members.

Yours for another prosperous year—

Cordially

KALAMAZOO VEGETABLE PARCHMENT CO.

Kalamazoo Michigan

KVP

vided with facilities for the employment of about 100 operatives. It is expected to have the mill ready for service in the spring.

Sundsvall, Sweden—The Swedish Cellulose Company, a subsidiary of the Kreuger & Toll Company, Stockholm, has begun the construction of a new mill in the vicinity of its present plant at Sundsvall, to be used for the production of kraft pulp. The plant will be of large proportions, consisting of several self-contained operating units, and will be equipped for initial output of approximately 100,000 tons of pulp per annum. It will be located near the company wharves at Sundsvall, to facilitate the shipment of material, and is reported to cost more than $2,000,000, with machinery.

Helsingfors, Finland—In an official report to the Bureau of Foreign and Domestic Commerce, Washington, D. C., James R. Wilkinson, United States Consul at Helsingfors, states that a local company is perfecting plans for the early construction of a new mill at Toppila, in the northern part of Finland, for the manufacture of cellulose pulp. It will consist of a number of units and will be equipped for an initial output of 2,500 tons per month. The plant is estimated to cost about $880,000. The project will include a large mechanical pulp mill for regular wood pulp production, designed for a capacity of 5,000 tons of wet pulp per month, and which, with auxiliary structures, is expected to cost about $1,400,000, with machinery. In addition, the company proposes to construct and operate a hydro-electric generating plant on the Niskakoski Rapids, in the vicinity of the mill sites, to provide power service at the plant. The station will be equipped for an initial output of 30,000 h.p., and is reported to cost over $800,000, with transmission lines. Information regarding the project is on file at the office of the Bureau of Foreign and Domestic Commerce, Reference Finland No. 326,322.

New Companies, Etc.

New York, N. Y.—Quincy P. Emery, Inc., New York, has been incorporated with a capital of $5,000, to deal in paper products of various kinds. The company will be represented by S. V. Ryan, Albany, N. Y., attorney.

Chicago, Ill.—The American Carton Corpoartion, 2600 West Fiftieth street, manufacturer of folding paper boxes, etc., has arranged for an increase in capital from $113,000 to $163,000, for expansion.

New York, N. Y.—The Domestic Mills Paper Company, 555 West 27th street, has filed notice of company dissolution under state laws.

Pawtucket, R. I.—The American Wall Paper Company has been incorporated with a capital of $50,000, to deal in wall papers, etc. The incorporators are J. P. O'Brien, Theodore Eskow, and C. F. Swarm, Brayton avenue, South Somerset, Mass.

UNIQUE SEAMAN SERVICE

The Seaman Paper Company, 411 W. Ontario street, Chicago, has undertaken a more or less novel departure in reaching out for new business. The company has established, and is widely advertising, a telephone service for business offices in the market for mimeograph, multigraph, typewriter and other office machines. The new service is known as "Local 7, the newest development in Seaman Service." The name is derived from the special wire given it, and it is organized exclusively for office users of business papers. The personnel of this division handling the service is composed of employees skilled and experienced in the special requirements of papers for business offices. In addition to the order taking facilities provided, "Local 7" offers a special advisory service in addition to the regular service extended all Seaman customers. Under the new plan, according to the Seaman Paper Company, buyers can purchase papers in office-use size and still have the same wide selection enjoyed in buying papers for printing use. The Chicago paper house also guarantees speed in delivery, immediate attention to calls for personal service and a direct mail service to provide further information.

HOW RUSSIA SUPPLIES PULPWOOD

That ten per cent of the pulpwood consumed in New York State comes from Russia was the statement made recently by Thomas C. Luther, Jr., of Saratoga Springs, at the New York State College of Forestry, Syracuse University. Mr. Luther has just returned from Russia. He is the forester-manager of seven thousand acres of reforested land.

He told how it was possible for Russia to ship pulpwood to New York at a profit. He said the nationalized forests of Russia were obtained by the Government at practically no expense and therefore forest products could be harvested and transported through Russia's splendid systems of waterways at a cost lower than competing nations. He also stated that pulpwood laid down in New York by Russia was of superior quality and that as long as it could be produced as cheaply as pulpwood from local or Canadian sources, it would be welcome.

"Seventy-one per cent of Russia's business is conducted under organizations called 'trusts,'" said Mr. Luther. The body that controls the export of timber would correspond in this country to an export commission. He said that Russia which has always been agrarian is being turned into an industrial nation. "The tendency there," he stated, "was to make larger and larger concessions to industrial organizations." The Soviet has planned development in five-year periods. They finished their first period in 1928 which in forestry fell short considerably of their expectations.

The average monthly labor wage in Russia is $32.45. He said the salaries paid to the Head of the Government was $125 per month. He praised the advance of education of both young and old and declared that illiteracy had been reduced from about eighty per cent to thirty-five per cent. He stated that the people of Russia generally are very poorly clad and that Moscow thronged with thousands of idle persons, most of them without food. There are hundreds in the bread lines of Moscow. He said that Russia had one of the finest armies ever organized, composed of 800,000 soldiers and that the Communists who govern, represent only five per cent of the people. All boys are subject to military service. It is Mr. Luther's opinion that the Soviet Government will endure, but with some modifications.

ROLLAND PAPER COMPANY

The annual report of the Rolland Paper Company, whose plant is at St. Jerome, Que., shows that earnings for the year of $440,480, before depreciation, were equivalent to 3.20 times bond interest paid, and after deducting bond interest and depreciation amounted to $230,980, or 2.56 times the preferred dividend. The year's surplus, after writing off proportion of organization expenses, was $130,980, which added to previous surplus makes the total profit and loss balance carried to the balance sheet $211,176.

In his report to shareholders Jean Rolland, president of the company, states in part: "In April of the year under review the new 86 Fine Paper Machine at the St. Jerome Mill came into operation, doubling the capacity of that mill. The delay in the commencement of the operation of this machine resulted in a decline in the anticipated earnings of your company, but despite this fact the directors regard the result of the year's operations as satisfactory."

PLANS SAFETY SCHOOL IN FALL

Consideration is being given by the Consolidated Water Power and Paper Company and other industries of Wisconsin Rapids, Wis., to another safety school in the fall of 1930. The attendance and success of the program this season were such that there is a demand for a continuance. Officials of the safety school will hold a later meeting with H. G. Noyes, who is in charge of this work for the Wisconsin Industrial Commission, to determine the exact plans.

WHAT ABOUT LUBRICATION

The most successfully operated mills in the paper industry are those where closest attention is given to doing things better and saving costs.

It is astonishing what may be accomplished by even such a matter as lubrication. Some executives regard it as comparatively unimportant. Others have found in effective lubrication a way to saving thousands annually. Actually—the yearly consumption of lubricants is often less. But the big saving comes with the results of effective lubrication in better machine operation, reduced depreciation and fewer shutdowns.

Ask to have a Texaco Lubrication Engineer visit your plant. These men have had long experience in paper mill lubrication. They know lubricants and they are backed by a complete line of Texaco Lubricants for every purpose. This experience is freely available to operators everywhere. Write The Texas Company first.

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POWER PLANT SECTION

REDUCING POWER COSTS THROUGH UNIT TREATMENT

Conducted by Reginald Trautschold Consulting Engineer

Cranes—Hoists—Trucks

Materials Handling Systems Indispensable

Not only are there "wonderful works" in a wheelbarrow, but it is certain that the great output of pulp and paper mills would be sharply limited and the disposal of the mills' products at anywhere near the present market prices quite impossible were it not for the assistance rendered by cranes, hoists, trucks and virtually every other recognized offspring of this humble antecedent of modern materials handling equipment. Transport of raw materials to the machines, advance of work in process through the mills and the disposal of the product, one and all, command the use of these modern mechanical aids. Even the paper machine itself may be quite properly looked upon as a piece of materials handling equipment and one, incidentally, of a very high order, for it exemplifies in a striking manner the principles of the conveyor, or assembly line, system of manufacture which have literally revolutionized modern production methods.

Indispensable as is materials handling equipment in curtailing production costs and expediting mill output, however, there is no prescribed way of going about effecting such savings. In fact,

Courtesy: Shepard Niles Crane & Hoist Corp.

FIG. 1

Storage pile of ground wood pulp, crane runway, transfer crane and monorail hoist at the Algonquin Paper Corp. plant, Ogdensburg, N. Y.

the materials handling problem of almost every mill is distinctive, to be solved to the best advantage only when taking into account the very many individual factors and influences pertaining to local conditions. Nevertheless, in almost every case limitations upon what can be done are imposed by financial considerations. The question of reasonable investment looms large and invariably commands caution, for while it is a fact that operating costs can almost always be substantially reduced by resorting to some efficient system of materials handling, no mill can well afford to assume an unduly high burden of fixed charges in order to do so. At times, dependence upon the lowly wheelbarrow may be the more advisable, while at others the use of much more intricate and costly devices proves more economical.

In any event, ways and means of curtailing production costs, of stimulating output and of expediting shipments to the market are

Courtesy: Shepard Niles Crane & Hoist Corp.

FIG. 2

Monorail hoist reclaiming from storage pile and entering spur leading to mill after leaving transfer crane at the Algonquin Paper Corp. plant.

of interest, and particularly so when the investment entailed has been quite moderate. A few specific examples of relatively inexpensive materials handling systems which have effected savings of an attractive order, then, may well be cited, not necessarily as being representative of the very best solution of the problem presented, even in the individual case, but rather as exemplifying ample justification for the outlay entailed. In doing so, moreover, no attempt will be made to cover all, or even many, of the numerous materials handling services common to pulp and paper mill requirements. Only a limited number of examples of such services in connection with the incoming storage of raw materials, distribution and transportation within the mill and a few very general remarks concerning approved methods of shipment, obviously, can be presented in an introductory discussion.

Storage and Reclamation

The storage and reclamation of pulp by a simple system of overhead handling equipment at the Algonquin Paper Corporation, Ogdensburg, N. Y., for instance, will serve admirably to illustrate a general scheme by which a liberal storage space, with excellent reclaiming facilities, was provided within the limits of a reason-

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Mills at { East Walpole, Mass. / West Groton, Mass.

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U. S. Patent granted in 1843 to J. M. & L. Hollingsworth for process of making paper from Manila Fibre.

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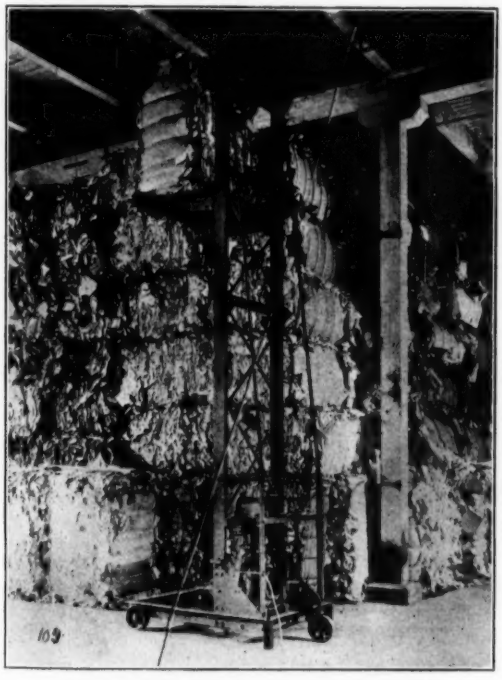
able and quite moderate investment in materials handling equipment, as judged from the point of view of the large savings effected. The installation was well justified, for while the materials handling system, erected and ready to run, entailed an investment, in this particular case, amounting to approximately $30,000.00, the savings realized, as compared with the cost of former methods of handling the pulp, were of quite high order, being represented by the very respectable item of $2.00 per ton of pulp handled.

Just what this signifies necessitates, of course, some idea of the activity of the establishment, where some 200,000 pounds of news print are produced daily. A ground wood mill is operated with a capacity of 180,000 pounds per 24-hours, 90 tons a day, and a sulphite pulp mill producing some 160,000 pounds every twenty-four hours, so a saving of $2.00 a ton in the cost of handling pulp clearly assumes handsome proportions during the year.

This economical, and it would appear highly profitable, system consists simply of a cage-operated monorail hoist, capable of picking up a couple of tons of ground wood pulp, and a type of overhead traveling crane, known as a transfer crane, for distributing the stock material to ground storage. The hoist takes the ground wood pulp from the wet-room, elevates it, takes it over a truss bridge of some 50 feet clear span over the railroad tracks adjacent to the mill, and runs out on the transfer crane. The latter is then employed for distributing the pulp over a liberal storage space as is clearly indicated in the views of the storage pile, crane runway, transfer crane of 55-foot span and the 2-ton



Courtesy: Economy Engineering Co.

FIG. 3

Lifting and tiering machine truck storing bales of paper scrap in the warehouse of the Container Corp. of America, Chicago.

monorail hoist. In bringing surplus ground wood pulp back into the mill, the cycle is simply reversed, or the crane and hoist may be used to charge a conveyor system delivering to a shredder adjacent to the storage pile.

Mill Storage and Transportation

The monorail hoist, either of the type operated from a cage or from the floor, under the right conditions, also proves a highly useful device for the economical handling and storage of heavy paper rolls, etc., in warehouse and mill. At the Hygrade Corrugated Paper Products Paper Company, Long Island City, N. Y., this system is in use and is said to have added 50 per cent to the storage facilities of the plant by enabling the heavy rolls of liner board to be compactly piled almost to the ceiling. Something like 1,000 lineal feet of elevated I-beam track serves the warehouse

Courtesy: Economy Engineering Co.

FIG. 4

Piling bales of rags in the warehouse of the Lettellier-Phillips Paper Corp., New Orleans.

floor and 500 feet care for the machine floor. Electric hoists of 1-ton capacity, suspended from ball-bearing trolleys on the I-beam track, do all the handling, carrying 500- to 1,500-pound rolls from the incoming freight cars, through the warehouse and up to the corrugated paper machines.

Another instance where this system of monorail hoist and overhead track has proved of inestimable value is at the mills of the Watervliet Paper Company at Watervliet, Mich., where coated book and lithograph papers are produced. When planning to remodel this plant to handle double production, it was found that this system for handling and storing rolls of paper, previously employed and as originally laid out, enabled double storage capacity to be secured with only 10 per cent additional materials handling equipment. An overhead, I-beam track of some 5,000 feet now reaches all parts of the enlarged plant and storage area and connects two buildings separated by two switch tracks, the passage over the railroad right-of-way being effected over a turn-table section, which, when open clears the tracks and, when closed, forms a continuous conveyor system.

With the aid of the system, five men do all the handling of rolls, substantially reducing the former pay roll, expediting storage and movement of rolls and minimizing damage to paper. Incidentally, a scale in the overhead track makes it possible for the rolls of paper to be weighed before and after coating without unloading or imposing any interruption to mill activities.

Where bales of paper scrap, etc., are stored, the now familiar lifting and tiering machine truck is a device which admittedly proves a most valuable aid in minimizing costs. At the Container

De Laval Pumps

Keep the plant running

THE pump here shown is equipped with an open impeller and delivers 2000 gals. per min. of stock from rifflers containing 2% of solids against 48 ft. head to flat screens in a paper mill. All parts of De Laval pumps are made to limit gages on an interchangeable basis and renewals can be inserted by unskilled men, as they do not require to be fitted.

De Laval Steam Turbine Co., Trenton, N. J.

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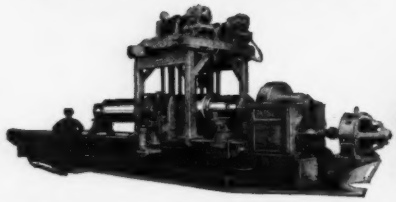
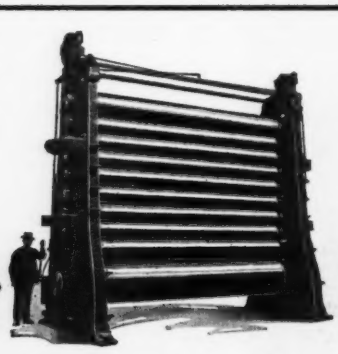
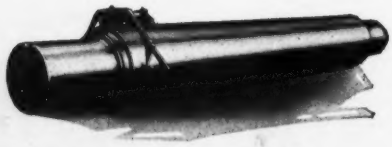
FARREL





FARREL



FARREL NEW TYPE ROLL GRINDER is electrically driven throughout, and is made in 24″, 32″, 36″ and 42″ sizes. All sizes are fitted with Geared Head, New Crowning Device and Automatic Lubrication.

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Successor to: { Farrel Foundry & Machine Co., Ansonia, Conn., Est. 1848
Birmingham Iron Foundry, Derby, Conn., Est. 1836

Corporation of America, Chicago, one of these machines of 1,250-pound capacity and 19-foot overall piling range has successfully withstood constant and heavy usage for almost twenty-two years. The view of this machine shows in a most convincing manner how very compactly the bales of paper can be stored. Skillful manipulation of the machine and the exercise of care in stacking

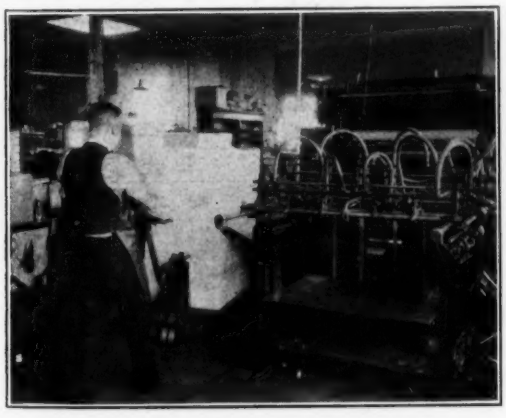
Courtesy: Lewis-Shepard Co.

FIG. 5

Lift trucks unload consignments of skidded pulp lap shipped in box cars both expeditiously and cheaply.

the bales makes it possible for one man to stack, trim and store 1,250 to 1,500 pound bales with no other aid than that afforded by box hooks for pulling the bales to the edge of the platform prior to dropping them into the space provided for their storage accommodation.

A similar storage machine and truck of slightly greater capacity is shown stacking bales of rags in the storage warehouse of the Lettellier-Phillips Paper Company, New Orleans, preparatory to shipment for use in the manufacture of paper. In another part of



Courtesy: Lewis-Shepard Co.

FIG. 6

Collecting large loads of flat paper stock from inspection tables for skid transport, minimizing handling time and crating charges.

this warehouse, the same machine is used for stacking bales of scrap paper.

Lift Trucks and Shipping Skids

For intermill handling of flat stock, paper and pulp, and for mill shipments, probably the most popular and at the same time one of the most economical methods of handling is by means of standard lift trucks. So very familiar have these efficient trucking aids become, however, that the several views shown of these devices engaged in typical paper mill services require little or no comments. Their very decided value is obvious. A few remarks concerning the now much favored method of dispatching flat paper stock consignments from the mills on shipping skids will be of somewhat greater interest.

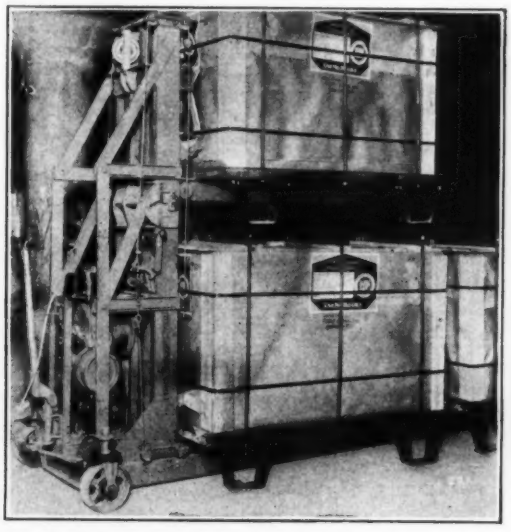
Two systems of skid shipments are in general vogue, one in

Courtesy: Lewis-Shepard Co.

FIG. 7

Consignments of flat paper stock firmly bolted on returnable skids for economical shipment.

which the shipping skids are returnable and the other in which they are not. The returnable shipping skids are the more substantially constructed, naturally, having a durable structural steel frame well put together and a serviceable hard wood floor. The clamping top used in conjunction with an approved variety of



Courtesy: Lewis-Shepard Co.

FIG. 8

Motor driven stacker (2½ ton capacity), for double decking loads of skidded paper—returnable skid shipment.

returnable skid is of a slightly bowed construction, the center of the boarding being some half inch lower than the sides. In clamping the load to the skid, this concentrates the pressure at the center and allows any air entrapped between the sheets of paper to escape. Concentrating the pressure at the center also serves to eliminate possibilities of slippage between layers of paper under rough handling.

While more expensive, naturally, than the non-returnable type

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of skid platforms, which serve simply to block up the bales of crated paper and enable the trucks to pick up the crates, the returnable shipping skids have proved highly remunerative in some instances. One prominent paper mill in New England has a supply of some 1,200 which have been in service for nearly four years, during which time the skids have averaged from twenty to

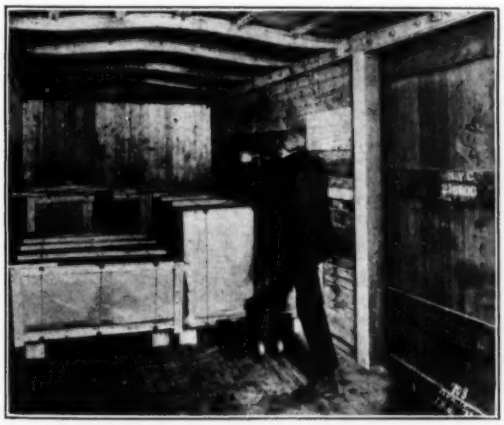
Courtesy: Yale & Towne Mfg. Co.

FIG. 9

Lift truck picking up crate of flat paper stock on non-returnable skid shipment.

twenty-five round trips of approximately 500 miles in each direction, between the mill and the destination of the consignment. Incidentally, it is claimed that this method of shipping has actually effected a saving of close to $5.00 a ton, or $10.00 per customary skid load.

The method of shipment enables the paper to be placed directly on the skids from the inspection tables and to be trucked into the freight cars without further handling. This also means quite a



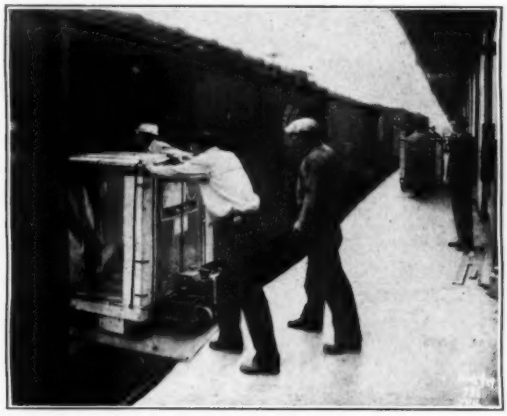
Courtesy: Yale & Towne Mfg. Co.

FIG. 11

Lift trucks expeditiously load box cars with heavy consignments of flat paper stock.

saving and at the mill in question the aggregate saving during the four years since the practice of making shipment of flat paper stock on returnable skids was inaugurated has been running somewhat better than $30,000.00 annually.

Shipping flat paper stock on non-returnable skids has also proved an economical and very attractive method, one of the first mills to adopt it having been the Champion Coated Paper Company, Hamilton, O. Since then, many other mills have adopted the method and only recently the West Virginia Pulp and Paper Company made a very careful study to ascertain the respective costs of shipping flat stock paper on non-returnable skid platforms and encasing the paper in wooden boxes. Thirty-six skid loads, each weighing 3,000 pounds, were shipped from the company's Mechanicville, N. Y., mills to a customer in Central California via



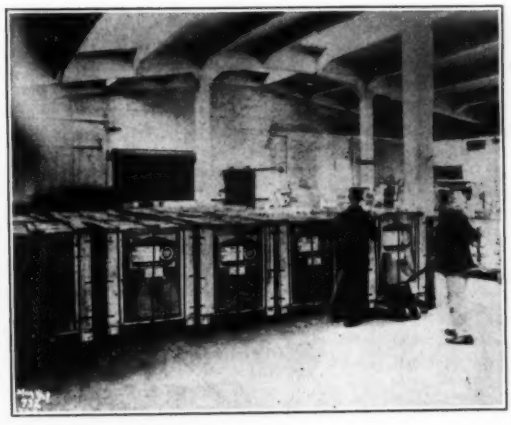
Courtesy: Yale & Towne Mfg. Co.

FIG. 10

Lift truck entering box car with crate of flat paper stock for non-returnable skid shipment.

the New York Central Railroad and the Munson Steamship Line.

The skid method not only proved the more economical, but the savings in packing costs alone were on the one shipment sufficient to warrant the expenditure for the lift truck equipment needed for handling the skid loads, to say nothing of the time and labor costs that were saved by the elimination of unnecessary rehandling of the product at the mills. Formerly, the flat paper stock had been shipped in 500 pound packages encased in wooden



Courtesy: Yale & Towne Mfg. Co.

FIG. 12

Heavy consignments of flat paper stock securely crated and strapped are handled with ease and speed by standard lift trucks.

boxes, costing between $2.50 and $3.00 per box. The non-returnable skids for each of the 3,000 pound units cost something like $3.00. On the entire shipment of thirty-six skid loads, the saving in actual packing costs amounted to approximately $540.00.

It was also conclusively demonstrated that the actual handling of the flat paper stock in 3,000 pound loads was considerably more economical than in 500 pound packages. Handling the 500 pound units manually, as is the customary procedure, not only consumed

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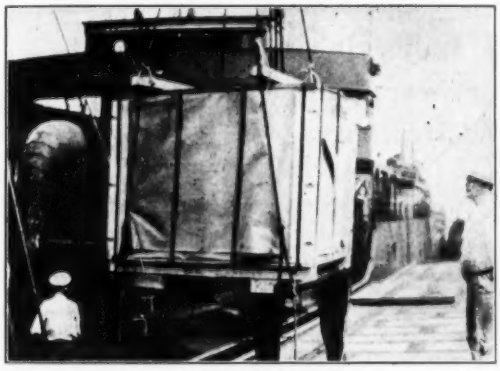
much more time and labor, but was a considerably more arduous task than handling 3,000 pound loads of paper on skid platforms by lift trucks.

Crating and Strapping

The steel strapped, crated consignments of flat paper stock, usually weighing from 3,000 to 4,500 pounds each, which have become an approved form of packing following the wide adoption of the one-trip, non-returnable system of shipment, are apparently arriving at their destinations all over the world, by rail or boat transport, in first class shape, the tightly drawn steel straps proving an efficacious protection against damage. With lumber corner guards and suitable top and bottom sheathing, the steel banding straps can be drawn up and locked in position under sufficient tension to eliminate any possible chance of load movement or slippage.

Where the consignments go to printers, in particular, this method of crating has proved a great convenience in subsequent handling of the stock. The skids are unloaded from truck or car and carried directly to the back of the presses by lift truck. The confining straps can then be readily removed and the wasteful, time consuming and frequently arduous task of lifting the paper out of wooden cases, little by little, and jogging it is avoided.



Courtesy: Signode Steel Strapping Co.

FIG. 13

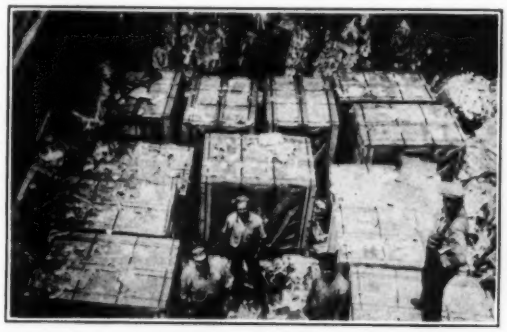
Flat paper stock firmly strapped to non-returnable skids circumvent the expense of heavy boxing even in boat shipments.

The system also cuts packing, shipping and freight expenses quite materially. In fact, cuts costs substantially all along the line from the moment the paper sheets are produced until they actually reach the premises of the wholesale consumer of the flat stock.

This emphasis placed upon crating and shipping methods may seem somewhat irrelevant to the topic of cranes, hoists and trucks in pulp and paper mill services, but the question of shipment is really of vital importance to the mills, particularly when the adoption of certain shipping practices and methods which are closely related to the materials handling equipment entailed, so simplify and cheapen their own dispatch costs that it enables their product to be laid down at just the right spot in their customer's establishment for several dollars less a ton. It is the ability of the standard lift truck to bring about just such very worthwhile economies that rightfully makes these transportation units virtually indispensible to the modern mill and well deserving of attention by all such establishments, large or small.

Another materials handling device which has literally slashed handling costs in the mill is the electric, industrial truck, extensively employed for the economical movement of flat stock, sulphite laps, news print, fine rolls, bales, boxes and bundles of every description and variety. This introduces, however, a somewhat specialized system of materials handling, though one that is extremely flexible and adaptable, which may well be reserved for discussion in subsequent installments.

It has been the aim of this introductory article to touch only upon a simple and relatively inexpensive transportation system employing permanently installed equipment and to feature chiefly the type of small truck, well within the means of all mills, which has done probably more in the way of reducing handling costs in



Courtesy: Signode Steel Strapping Co.

FIG. 14

Consignments of flat paper stock securely strapped to non-returnable skids well withstand rough handling.

and to the average mill and in expediting and cutting mill shipment and warehouse burdens than almost any other standardized device now on the market.

H. P. CARRUTH MADE VICE PRESIDENT

According to official announcement General Manager H. P. Carruth of the Mead Pulp and Paper Company has been elected a vice-president of that company, succeeding H. E. Talbott, Jr., resigned. All other officers were reelected.

"The honor," says the Chillicothe Advertiser, "is one that is merited and well-placed for Mr. Carruth is not only a man of marked ability in his chosen field but a dynamic executive.

"In addition to being a great source of satisfaction to his many friends, the announcement of Mr. Carruth's advancement as an executive officer of the company is especially good news to those financially interested in the company. Chillicothe is familiar with the growth of the business under Mr. Carruth's management and appreciate his services.

"After having received his schooling at the Massachusetts Institute of Technology and having been chief chemist for a number of years of the American Writing Pulp and Paper Company, and having been president of the Technical Association of the Pulp and Paper Industry, Mr. Carruth is admirably fitted for the position which he has held, and the directors of the company feel that his services as an executive officer of the company will be equally well done.

"The resignation of Mr. H. E. Talbott, Jr., as a vice-president was due to the fact that he has moved his residence to New York and is so busily engaged there in many other enterprises that it is impossible for him to give the attention he formerly did to the affairs of the Mead Pulp and Paper Company. Mr. Talbott retains all of his large holdings in the company and will remain on the board of directors.

"No other changes in the executive officers of the company were made at the recent meeting. Speed Warren continues as treasurer, R. T. Houk and N. S. Talbott continue as vice-presidents and R. E. Cowden as secretary."

HAMPDEN GLAZED ELECTS OFFICERS

At the annual stockholders' meeting of the Hampden Glazed Paper and Card Company of Holyoke, Mass., on February 14, the following officers were elected: President, Norman N. Fowler; vice-president and treasurer, Ralph N. Fowler; secretary, William S. Fowler.

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News Print

PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

For the Month Ending December 31, and for the Twelve Months Ending December 31, 1929 as Compared with Corresponding Month of Previous Year

IMPORTS—PAPER

	December				Twelve Months Ending December 31			
	1928		1929		1928		1929	
Paper and Manufactures	Quantity	Value $14,482,842	Quantity	Value $14,814,345	Quantity	Value $156,406,552	Quantity	Value $163,184,327
Printing paper—								
Standard newsprint ....lbs...free	416,253,542	13,112,568	461,156,693	13,540,746	4,314,332,865	139,432,918	4,845,401,341	144,492,736
Imported from—								
Finland ....lbs.	9,239,495	239,195	5,879,670	132,872	80,478,655	2,080,710	65,213,906	1,564,362
Germany ....lbs.	1,456,710	46,389	1,340,924	32,728	18,333,284	499,926	18,499,244	453,464
Norway ....lbs.	2,636,622	67,146	1,338,808	36,839	21,728,251	583,476	6,996,997	177,821
Sweden ....lbs.	9,445,978	253,687	10,661,956	263,842	111,238,867	2,949,230	101,438,043	2,576,079
Canada ....lbs.	360,800,268	11,526,918	418,954,422	12,425,528	3,853,495,242	126,174,545	4,389,174,594	132,282,041
Newfoundland and Labrador ....lbs.	32,674,469	979,233	22,980,913	648,937	228,343,968	7,124,171	263,829,909	7,433,636
Other countries ....lbs.	.....	.....	.....	.....	714,598	20,860	248,648	5,333
All other n. e. s. ....lbs...dut.	665,068	30,135	342,241	18,279	7,339,078	342,991	4,359,782	220,509
Grease-proof and water-proof papers ...lbs...dut.	62,451	11,564	81,294	21,621	1,261,844	231,621	1,776,599	460,137
Kraft wrapping paper ....lbs...dut.	949,956	40,197	693,804	32,108	10,762,437	460,294	9,796,151	423,187
Other wrapping paper ....lbs...dut.	1,121,324	30,339	488,260	24,339	16,223,695	392,262	7,115,166	221,278
Writing, letter, drawing, etc., papers ..lbs...dut.	269,126	57,325	264,607	80,424	3,107,574	806,502	3,226,740	892,952
Surface-coated paper ....lbs...dut.	210,324	86,454	155,475	65,978	2,370,859	1,103,611	2,452,236	1,046,201
Tissue, copying, etc., papers ....lbs...dut.	330,630	180,341	385,977	212,676	3,569,399	2,052,872	5,008,881	2,667,680
Paper boards, n. e. s.—								
Pulp boards in rolls ....lbs...dut.	4,007,239	85,508	3,383,232	70,683	52,770,222	1,150,968	58,724,555	1,271,740
Paper boards, pulp board, and card-board ....lbs...dut.	1,351,488	33,980	1,329,201	31,737	21,105,834	470,289	20,488,302	486,231
Leather board, test, and wall board..lbs...dut.	87,247	4,440	97,905	4,532	880,051	27,434	2,048,444	86,106
Cigarette paper, cigarette books, and covers ....lbs...dut.	1,001,691	321,495	605,935	213,899	11,689,018	3,213,981	11,687,109	3,921,984
Hanging paper, (wall paper) ....lbs...dut.	288,719	60,481	432,607	88,000	2,164,176	657,163	2,875,860	750,027
Duplex decalcomania paper, not printed..lbs...free	15,921	3,768	20,049	4,777	626,467	141,704	585,524	145,870
Paper boxes ....dut.	.....	135,071	.....	100,628	.....	1,789,421	.....	1,720,093
Pulp or papier-mâché and manufactures, n. e. s. ....dut.	.....	43,672	.....	41,250	.....	435,633	.....	580,547
All other paper and manufactures ....dut.	.....	245,504	.....	262,668	.....	3,696,888	.....	3,797,049
WOOD PULP								
Mechanically ground wood pulp ....tons...free	24,260	585,274	32,309	856,156	222,499	5,443,495	244,162	6,245,776
Sulphite wood pulp ....tons	100,867	5,880,818	82,438	4,961,388	948,586	55,955,558	1,035,691	60,667,585
Unbleached ....tons..free	71,910	3,692,275	50,270	2,527,921	640,660	32,587,134	701,456	35,328,982
Bleached ....tons..free	28,957	2,188,543	32,168	2,433,467	307,926	23,368,424	334,235	25,338,603
Imported from—								
Finland ....tons	8,633	398,833	13,536	682,529	94,278	4,157,042	116,427	5,584,217
Germany ....tons	6,764	453,240	4,783	337,755	63,525	4,231,959	62,293	4,348,415
Norway ....tons	6,414	387,815	4,531	323,571	63,668	4,230,090	57,637	3,916,985
Sweden ....tons	44,630	2,471,581	25,049	1,414,369	333,367	18,451,565	397,351	21,925,767
Canada ....tons	31,753	1,998,660	31,892	2,048,536	356,558	22,805,358	378,034	23,609,440
Other countries ....tons	2,673	170,689	2,647	154,628	37,190	2,079,544	23,949	1,282,761
Sulphate wood pulp, unbleached, (kraft pulp) ....tons..free	59,444	3,222,447	35,282	1,799,457	381,256	21,170,948	384,005	20,518,676
Imported from—								
Finland ....tons	5,000	235,173	1,643	73,489	28,843	1,301,769	27,108	1,286,894
Norway ....tons	2,625	135,194	1,751	81,794	15,214	824,491	16,404	847,694
Sweden ....tons	37,975	2,023,957	23,263	1,134,549	193,145	10,136,956	224,371	11,327,331
Canada ....tons	13,172	796,221	8,293	494,979	139,945	8,718,018	110,366	6,792,782
Other countries ....tons	672	31,902	332	14,646	4,109	189,714	5,756	263,975
Sulphate wood pulp, bleached ....tons..free	2,178	126,692	776	62,119	14,590	894,587	15,364	1,139,820
Other pulp ....tons..free	309	23,142	477	36,213	6,728	455,190	6,050	514,139
CRUDE PAPER STOCK								
Rags for paper stock ....lbs...free	32,752,543	693,980	41,243,596	817,199	439,892,896	9,195,224	446,496,028	9,341,795
Waste bagging, waste paper, etc. ....lbs...free	11,931,830	137,488	9,015,425	101,695	148,756,214	1,957,937	141,615,462	1,657,562
Old rope and all other paper stock ....lbs...free	8,606,368	267,000	14,398,022	193,092	70,723,965	2,065,267	131,084,841	3,448,438
CHEMICALS AND OTHER PAPER MAKERS' MATERIALS								
Colors, dyes, stains, color acids, and color bases, n. e. s. ....lbs...dut.	779,507	839,392	486,418	516,485	6,252,157	6,876,606	7,593,119	8,448,037
Imported from—								
Belgium ....lbs.	7,658	8,965	4,788	6,589	114,977	136,966	76,259	95,819
France ....lbs.	10,083	9,968	550	502	74,284	89,991	108,312	160,012
Germany ....lbs.	581,617	616,610	252,777	248,426	4,055,619	4,249,849	4,685,326	5,019,070
Italy ....lbs.	6,824	5,286	2,646	2,139	64,954	60,103	13,854	11,626
Switzerland ....lbs.	118,660	138,771	216,979	250,566	1,638,662	2,004,560	2,563,469	3,000,159
United Kingdom ....lbs.	5,896	9,167	6,129	4,492	98,027	95,507	91,957	100,779
Other countries ....lbs.	48,769	50,625	2,549	3,771	205,634	239,630	53,942	60,572
Casein or lactarene ....lbs...dut.	1,934,747	225,823	1,743,740	217,147	28,651,215	3,677,941	27,583,339	3,323,130
Kaolin, china, and paper clay ....tons..dut.	36,557	433,988	16,892	171,382	274,472	2,963,055	249,921	2,699,380

(Continued on page 303)

for PAPER

Paper that satisfies when price is not considered—paper that satisfies when price is the FIRST consideration—above all, paper that prints well and helps put the message over—

Sole Distributors of
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FOLDING
ENAMEL
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Cover

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(Limited)

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R. R. MANILAS AND SPECIALTIES

PAPER

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E. D. LINDBERG, Secy.
S. C. ROSEBUSH, Treas.

PAPER AND PAPER STOCK IMPORTS AND EXPORTS OF THE UNITED STATES

(Continued from page 301)

EXPORTS—PAPER

	December				Twelve Months Ending December 31			
	1928		1929		1928		1929	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Paper and Manufactures	.....	$2,697,288	.....	$3,146,709	.....	$30,933,131	.....	$37,379,685
Printing paper—								
Newsprint paper ....lbs.	1,325,824	52,284	6,504,269	210,370	22,779,930	865,956	37,391,882	1,346,018
Exported to—								
Canada ....lbs.	48,975	2,436	7,080	234	243,931	10,541	762,060	36,940
Central America ....lbs.	115,524	4,228	109,490	4,200	1,230,552	43,538	1,759,562	64,073
Cuba ....lbs.	216,726	7,284	505,205	19,427	3,799,523	139,563	3,544,014	128,651
South America ....lbs.	258,765	9,969	4,408,783	133,132	5,578,769	214,163	14,979,796	508,593
China, Hong Kong, and Kwantung ...lbs.	422,485	18,028	47,411	1,742	3,026,788	112,844	4,478,718	152,355
Philippine Islands ....lbs.	198,189	7,650	1,237,813	41,081	7,491,651	292,070	9,166,502	319,086
Other countries ....lbs.	65,160	2,689	188,487	10,554	1,408,716	53,237	2,701,230	136,320
Book paper, not coated ....lbs.	2,715,624	188,817	4,109,161	266,365	24,510,519	1,789,694	37,817,028	2,651,325
Exported to—								
Europe ....lbs.	82,325	6,294	48,400	9,221	609,284	61,460	1,596,952	155,698
Canada ....lbs.	1,402,279	77,344	1,154,456	66,345	9,337,649	557,364	12,198,178	725,272
Mexico ....lbs.	32,656	3,548	36,712	4,193	510,567	56,696	570,858	60,244
Cuba ....lbs.	422,778	30,619	644,110	38,907	4,832,844	351,493	5,344,241	370,890
Argentina ....lbs.	138,723	10,569	113,233	11,820	658,671	58,792	1,911,475	153,758
Other South America ....lbs.	120,143	12,453	140,359	11,132	1,251,749	107,368	1,351,326	115,487
China, Hong Kong, and Kwantung ...lbs.	46,318	5,253	1,450,759	85,248	1,849,236	150,264	7,907,850	480,048
Philippine Islands ....lbs.	225,516	14,623	332,852	24,254	2,666,852	174,607	4,050,300	277,741
Australia ....lbs.	158,628	20,442	21,281	2,198	1,047,264	127,319	1,092,349	161,177
Other countries ....lbs.	86,258	7,672	166,999	13,047	1,746,403	144,331	1,793,499	151,010
Cover paper ....lbs.	168,335	29,288	178,235	31,043	2,037,523	340,972	2,053,996	356,445
Grease-proof and water-proof paper ....lbs.	223,658	38,072	294,994	41,485	3,107,467	489,647	2,908,120	526,281
Overissue newspapers ....lbs.	.....	.....	20,608,305	194,608	.....	.....	154,078,379	1,668,085
Wrapping paper ....lbs.	3,548,381	237,779	3,960,644	287,682	36,757,253	2,586,848	43,882,689	2,957,204
Surface-coated paper ....lbs.	1,364,776	122,245	2,376,327	188,553	11,156,835	1,137,134	17,317,750	1,576,916
Tissue and crêpe paper ....lbs.	363,595	82,933	410,530	84,219	4,995,465	1,096,424	4,798,279	1,061,250
Toilet paper ....lbs.	521,029	56,972	532,775	62,550	6,448,053	685,478	7,030,815	787,919
Paper towels and napkins ....lbs.	268,302	36,150	290,855	31,806	3,018,379	399,910	3,617,890	435,308
Box board ....lbs.	2,456,331	64,761	4,230,964	109,685	48,669,581	1,353,561	53,458,595	1,614,535
Bristols and bristol board ....lbs.	253,548	23,857	243,150	24,229	1,979,152	220,966	2,908,260	286,400
Other paper board and strawboard ....lbs.	2,748,448	144,879	4,618,478	191,046	42,124,168	2,149,565	47,315,391	2,096,798
Sheathing and building paper ....lbs.	1,611,842	57,785	1,364,914	48,025	14,854,482	551,059	22,475,764	756,329
Fiber insulating lath or board ....sq. ft.	.....	.....	3,477,430	117,352	.....	.....	30,324,245	1,026,312
Wall board of paper or pulp ....sq. ft.	6,253,092	201,864	3,600,921	118,762	61,600,700	2,068,788	68,049,488	2,220,879
Blotting paper ....lbs.	292,983	34,350	242,615	30,694	3,920,957	445,510	3,606,483	428,997
Filing folders, index cards, and other office forms ....lbs.	86,479	38,231	147,575	53,482	1,502,400	516,123	1,633,954	599,260
Papeteries, (fancy writing paper) ....lbs.	32,917	10,138	34,942	10,523	752,040	196,079	855,149	207,990
Other writing paper ....lbs.	2,686,303	255,383	2,113,251	229,297	25,833,846	2,832,934	27,989,532	2,955,587
Paper hangings, (wall paper) ....yds.	2,093,030	34,906	2,217,468	39,888	33,950,960	641,570	27,434,475	581,684
Paper bags ....lbs.	939,214	76,401	946,733	76,880	9,155,249	801,027	12,061,231	1,010,522
Boxes and cartons ....lbs.	2,410,382	151,520	1,592,386	124,138	28,448,969	1,900,825	28,120,494	1,891,939
Envelopes ....lbs.	189,581	34,487	203,024	36,040	2,453,119	405,505	2,421,472	428,551
Vulcanized fiber sheets, strips, rods, and tubes..lbs.	501,369	153,631	364,779	91,543	5,523,712	1,455,175	6,116,832	1,487,714
Manufactures of vulcanized and indurated fiber..lbs.	35,785	7,912	16,607	7,254	467,713	136,432	383,109	103,477
Cash-register and adding-machine paper ....lbs.	271,475	29,151	392,619	39,121	3,419,258	359,140	5,507,358	522,125
Other paper and paper products	.....	533,492	.....	400,069	.....	5,506,809	.....	5,793,835
WOOD PULP AND PAPER STOCK								
Sulphite wood pulp ....tons	3,220	212,520	2,229	125,683	22,272	1,308,459	39,154	2,116,428
Soda wood pulp ....tons	140	11,374	175	14,198	2,441	194,325	1,961	159,988
Other wood pulp ....tons	742	45,652	1,376	72,589	5,183	276,395	7,160	453,007
Rags and other paper stock ....lbs.	18,752,376	266,688	5,387,775	108,187	230,626,480	4,103,118	108,415,529	1,884,610
PAPER AND PULP MILL MACHINERY								
Paper and pulp mill machinery	.....	207,044	.....	182,571	.....	3,066,942	.....	3,916,936

BUILDING BIGGEST KRAFT MILL

The Swedish Cellulose Company, formed last fall by Kreuger & Toll Company to control Swedish companies representing over 30 per cent of Sweden's wood pulp production, is beginning construction of a mill which will be the largest in the world specializing in Kraft pulp. The new plant, which will have a maximum annual capacity of 100,000 tons, is being constructed adjacent to the company's own wharves in the harbor near Sundsvall, which is of great economic value in that it is accessible to ocean going ships nine months of the year.

The Sundsvall site for the 100,000 ton pulp plant was selected not only on account of its harbor facilities but also because of its splendid railway connections and the fact that the mill will be able to obtain fresh water for manufacture from the Indal River through a two mile conduit. Power will be supplied partly from the mill's own steam plant and partly from the controlled Hammarsforsen's Power Company.

The new Kraft pulp mill is expected to be in operation by the summer of 1931. Operating at full capacity it will employ 400 persons.

McLAREN PROJECT PROCEEDS

Meanwhile the Quebec Government has been up against another awkward situation. Long ago it approved plans for the establishment of a 250 ton news print mill at Buckingham, Que., by the MacLaren interests. Work on this is proceeding, and the relentless march of events brought the Quebec Government this week face to face with the call for its approval of the company's power project on the Lievre River. Notwithstanding that this is another step towards bringing the news print mill into operation this fall, and therefore adding another complication to the news print problem, there was nothing for it but to give approval to the plans.

The hydro-electric development will be fed from a dam at Cedar Rapids on the Lievre River. Waters in White Fish Lake, and the river down as far as the Wabasee Rapid, will be included in the new Storage. The power house will be at High Falls, same 30 miles from Buckingham, where there is a fall of approximately 120 feet. It is hoped to develop some 90,000 horsepower. Considerable work has already been done on this project, and the news print building has already been completed in readiness for the installation of machinery.

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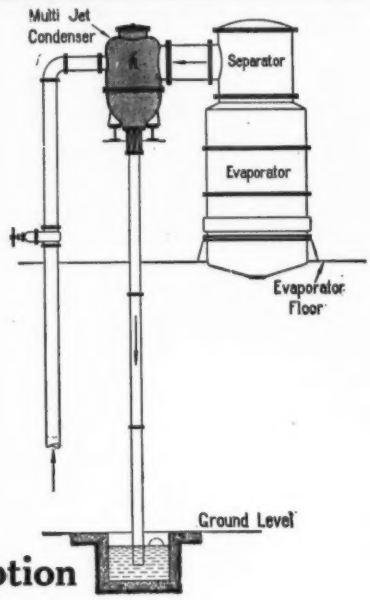
for

black liquor evaporators



They operate without air pumps
(Multiple water jets condense the steam and remove the air)

High vacuum—Minimum water consumption

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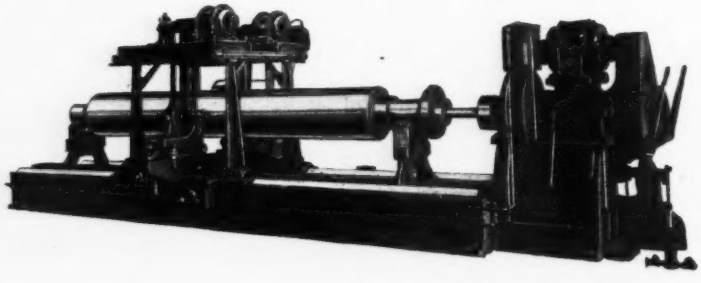
IMPROVED ROLL GRINDING MACHINE



A new model with enclosed geared driving head and full automatic lubrication including the Vs. and the feed-screw.

RAPID
ACCURATE
LONG-LIVED

The automatic crowning device and the provision for leveling the bed are exclusive features of the Lobdell Roll Grinders.

LOBDELL CAR WHEEL COMPANY
Established 1836
WILMINGTON, DELAWARE

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING FEBRUARY 15, 1930

SUMMARY

Cigarette paper .....198 cs.
Wall paper .....27 pkgs., 278 cs., 73 cs.
Paper hangings ..... 85 bls., 10 cs.
News print .....2350 rolls
Printing paper .....39 rolls, 180 cs.
Wrapping paper .....103 cs.
Packing paper .....90 rolls, 24 bls., 2 cs.
Drawing paper .....24 cs.
Filter paper .....42 cs.
Filter pulp .....50 bls.
Tissue paper .....61 cs.
Writing paper .....7 cs.
Surface coated paper .....79 cs.
Baryta coated paper .....222 crates
Metal coated paper .....40 cs.
Metal paper .....8 cs.
Photo paper .....1 cs.
Colored paper .....9 bls., 75 cs.
Crepe paper .....1 cs.
Decalcomania paper .....40 cs.
Copy paper .....31 cs.
Stencil paper and ink .....25 cs.
Miscellaneous paper .....24 cs.

CIGARETTE PAPER

De Manduit Paper Corp., Liberty, Havre, 198 cs.

WALL PAPER

R. F. Downing & Co., Takaoka Maru, Yokohama, 4 cs.
F. J. Emmerich, American, Hamburg, 27 bls.
Globe Shipping Co., American, Hamburg, 49 bls.
F. J. Emmerich, American, Hamburg, 7 bls.
A. C. Dodman, Jr., Inc., Mauretania, Southampton, 4 bls., 2 cs.
W. H. S. Lloyd & Co., Minnewaska, London, 1 cs., 9 bls.
R. F. Downing & Co., Minnewaska, London, 4 cs., 5 bls.
F. J. Emmerich, Minnewaska, London, 1 ble.
F. A. Binder, Muenchen, Bremen, 4 cs.
J. E. Bernard & Co., Nortonian, Antwerp, 27 pkgs.
W. J. Jones & Co., Liberty, Havre, 2 cs.
F. J. Emmerich, Cedric, Liverpool, 9 bls.
J. Henschel, Westphalia, Hamburg, 5 bls.
Tice & Lynch, Westphalia, Hamburg, 2 bls.
F. J. Emmerich, Westphalia, Hamburg, 160 bls., 1 cs.
Guaranty Trust Co., Westphalia, Hamburg, 55 cs.

PAPER HANGINGS

Whiting & Patterson Co., Inc., Mauretania, Southampton, 3 bls., 8 cs.
W. H. S. Lloyd & Co., Minnewaska, London, 2 cs., 20 bls.
A. C. Dodman, Jr., Inc., Scythia, Liverpool, 62 bls.

NEWS PRINT

———, Fred. III, Oslo, 42 rolls.
Parsons & Whittemore, Inc., Muenchen, Bremen, 1082 rolls.
H. Reeve Angel & Co., Inc., Korsholm, Kotka, 74 rolls.
Parsons & Whittemore, Inc., Carplaka, Helsingfors, 268 rolls.
Lunham & Reeve, Carplaka, Helsingfors, 357 rolls.
Gilman Paper Co., Carplaka, Sundsvall, 149 rolls.
Perkins Goodwin & Co., Westphalia, Hamburg, 508 rolls.

PRINTING PAPER

Keuffel & Esser Co., America, Hamburg, 39 rolls.
Sylvania Industrial Corp., H. Jaspas, Antwerp, 32 cs.
Japan Paper Co., Mauretania, Southampton, 1 cs.
P. C. Zuhlke, Nortonian, Antwerp, 96 cs.
E. Dietzgen & Co., Westphalia, Hamburg, 51 cs.

WRAPPING PAPER

Yardley Co., Minneswaska, London, 4 cs.
Sylvania Industrial Corp., Nortonian, Antwerp, 99 cs.

PACKING PAPER

Wilkinson Bros., Inc., Toronto, Oslo, 90 rolls, 24 bls.
Gevaert Co., of America, Nortonian, Antwerp, 2 cs.

DRAWING PAPER

Keuffel & Esser Co., America, Hamburg, 17 cs.
H. Reeve Angel & Co., Inc., Minnewaska, London, 7 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Minnewaska, London, 19 cs.
C. Schleicher Schull Co., Westphalia, Hamburg, 23 cs.

FILTER PULP

F. Bing, Muenchen, Bremen, 50 bls.

TISSUE PAPER

W. J. Byrnes, Mauretania, Southampton, 3 cs.
W. J. Byrnes, Cedric, Liverpool, 13 cs.
Baldwin Universal Co., Scythia, Liverpool, 4 cs.
F. C. Strype, Scythia, Liverpool, 3 cs.
F. C. Strype, Korsholm, Kotka, 38 cs.

WRITING PAPER

Japan Paper Co., Mauretania, Southampton, 1 cs.
Guibout freres, Mauretania, Southampton, 4 cs.
The Eleto Co., Mauretania, Southampton, 2 cs.

SURFACE COATED PAPER

Phoenix Shipping Co., America, Hamburg, 2 cs.
Gevaert Co. of America, H. Jaspar, Antwerp, 110 cs.
Gevaert Co. of America, Nortonian, Antwerp, 67 cs.
P. C. Zuhlke, Nortonian, Antwerp, 10 cs.

BARYTA COATED PAPER

J. H. Schroeder Banking Corp., Muenchen, Bremen, 222 crates.

METAL PAPER

Hensel, Bruckman & Lorbacher, Muenchen, Bremen, 40 cs.

METAL COATED PAPER

Hensel, Bruckman & Lorbacher, Muenchen, Bremen, 8 cs.

PHOTO PAPER

J. J. Gavin, Mauretania, Southampton, 1 cs.

COLORED PAPER

F. L. Kramer, Muenchen, Bremen, 3 cs.
S. Gilbert, Muenchen, Bremen, 13 cs.
Quality Art Novelty Co., Muenchen, Bremen, 9 bls.
E. Dietzgen & Co., Westphalia, Hamburg, 57 cs.
D. F. Young, Westphalia, Hamburg, 2 cs.

CREPE PAPER

H. Lange, Muenchen, Bremen, 1 cs.

DECALCOMANIA PAPER

C. W. Sellers, Muenchen, Bremen, 20 cs.
B. F. Drakenfeld & Co., Cedric, Liverpool, 20 cs. (duplex).

COPY PAPER

Whitfield Paper Works, Takaoka Maru, Kobe, 31 cs.

STENCIL PAPER AND INK

Arlac Dry Stencil Corp., Westphalia, Hamburg, 25 cs.

MISCELLANEOUS PAPER

Vacuum Oil Co., Fred. VIII, Copenhagen, 3 cs.
W. A. Foster & Co., Minnewaska, London, 5 cs.
———, Muenchen, Bremen, 13 cs.
Hensel, Bruckman & Lorbacher, Muenchen, Bremen, 8 cs.
American Express Co., Muenchen, Bremen, 7 cs.

RAGS, BAGGINGS, ETC.

H. G. Lichtenstein, Kepwick Hall, Barcelona, 68 bls. jute waste.
The Barrett Co., Kepwick Hall, Bilbao, 78 bls. rags.
Equitable Trust Co., Kepwick Hall, Marseilles, 158 bls. paper waste.
———, H. Jaspar, Antwerp, 129 bls. bagging.
Manufacturers Trust Co., Fred. VIII, Copenhagen, 186 bls. rags.
N. Y. Trust Co., Minnewaska, London, 34 bls. rags.
S. Birkenstein & Son, American Farmer, London, 112 bls. paper stock.
International Accep. Bank, Muenchen, Bremen, 52 bls. bagging.
Irving Trust Co., Muenchen, Bremen, 43 bls. rags.
Irving Trust Co., Liberty, Dunkirk, 59 bls. rags.
Katzenstein & Keene, Inc., Liberty, Dunkirk, 158 bls. rags.
Intl. Germanic Trust Co., Brazil Maru, Hamburg, 84 bls. rags.
Albany Fibre Co., New York City, Bristol, 113 bls. rags.
A. C. Spark Plug Co., Cedric, Liverpool, 13 bls. bagging.
Guaranty Trust Co., Kioto, Antwerp, 118 bls. flax waste.
Intl. Germanic Trust Co., Kioto, Antwerp, 151 bls. flax waste.
Irving Trust Co., Kioto, Antwerp, 42 bls. burlap.
E. J. Keller Co., Inc., Kioto, ———, 151 bls. flax waste.
American Express Co., Bellepline, Antwerp, 19 bls. rags.
Katzenstein & Keene, Inc., Bellepline, Antwerp, 75 bls. rags.
Phila. National Bank, Westphalia, Hamburg, 16 bls. rags.
Chase National Bank, Westphalia, Hamburg, 40 bls. rags.
Bank of The Manhattan Co., Westphalia, Hamburg, 5 bls. rags.

OLD ROPE

Brown Bros. & Co., Saturnia, Trieste, 66 coils.
Brown Bros. & Co., Alfonso XIII, Corunna, 141 coils.
Brown Bros. & Co., Fred VIII, Copenhagen, 170 coils.
Brown Bros. & Co., Nortonian, Antwerp, 57 coils.
Brown Bros. & Co., New York City, Bristol, 83 coils.

CASEIN

A. Klipstein & Co., Minnewaska, London, 100 bags.
Atterbury Bros. Inc., Pan America, B. Ayres, 2084 bags.
2nd Natl. Bank of Boston, Pan America, B. Ayres, 1168 bags.
———, Pan America, B. Ayres, 705 bags.
T. M. Duche & Son, Pan America, B. Ayres, 834 bags.

WOOD PULP

———, America, Hamburg, 381 bls. wood pulp, 76 tons.
Atterbury Bros., Inc., Fred VIII, Oslo, 750 bls. wood pulp, 150 tons.
J. Andersen & Co., Toronto, Greaker, 3110 bls. sulphite.
Pagel Horton & Co., Inc., Modemi, Gefle, 500 bls. wood pulp, 50 tons.
Price & Pierce, Ltd., Modemi, Wallvik, 2700 bls. sulphite, 450 tons.
Bulkley, Dunton & Co., Modemi, ———, 2250 bls. wood pulp, 462 tons.
Lagerloef Trading Co., Korsholm, Viborg, 640 bls. sulphite.
Lagerloef Trading Co., Korsholm, Kotka, 1223 bls. sulphate.
Bulkley, Dunton & Co., Carpalka, ———, 2375 bls. sulphite, 475 tons.
———, Carplaka, Hernosand, 900 bls. sulphite, 150 tons.

WOOD PULP BOARDS

Lagerloef Trading Co., Carplaka, Helsingfors, 115 bls., 51 tons.

(Continued on page 307)

The Jessup & Moore Paper Co.

PHILADELPHIA NEW YORK

MANUFACTURERS OF

HIGH GRADE BOOK PAPER

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THIONITE SODA PULP

CHAMPION-INTERNATIONAL COMPANY

LAWRENCE, MASSACHUSETTS

Manufacturers of

High Grade Surface Coated Papers

MILLS AT LAWRENCE, MASSACHUSETTS

Enameled Book a Specialty

Imports of Paper and Paper Stock

(Continued from page 305)

PHILADELPHIA IMPORTS

WEEK ENDING FEBRUARY 15, 1930

Castle & Overton, Inc., Udondo, Bilbao, 152 bls. rags.
Castle & Overton, Inc., Liberty, Havre, 132 bls. rags.
S. E. Ingber, Liberty, Havre, 54 bls. rags.
Natl. Vulcanized Fibre Co., Liberty, Havre, 99 bls. new cuttings.
G. Mathes & Co., Liberty, Havre, 64 bls. rags.
Darmstadt, Scott & Courtney, Liberty, Havre, 108 bls. rags.
Katzenstein & Keene, Inc., Liberty, Havre, 65 bls. bagging; 165 bls. rags.
D. I. Murphy, Liberty, Havre, 84 bls. bagging.
Darmstadt, Scott & Courtney, Liberty, Dunkirk, 107 bls. rags.
J. M. Hagy Waste Works, Liberty, Dunkirk, 47 bls. rags.
Union Waste Co., Liberty, Dunkirk, 49 bls. rags.
G. Mathes & Co., Liberty, Dunkirk, 61 bls. rags.
Katzenstein & Keene, Inc., Liberty, Dunkirk, 792 bls. rags, etc.
C. B. Richard & Co., New York City, Bristol, 108 bls. rags.
——, Carplaka, Hernosand, 1650 bls. sulphate, 275 tons.
——, Carplaka, Hernosand, 3450 bls. sulphite, 575 tons.
Bulkley, Dunton & Co., Carplaka, ——, 2000 bls. sulphite, 400 tons.
Gilman Paper Co., Carplaka, Sundsvall 708 rolls news print.
E. J. Keller Co., Inc., Bellepline, ——, 77 bls. jute cuttings.
F. Weber & Co, Bellepline, Antwerp, 7 es. paper.
McBlaine & Co., Bellepline, Antwerp, 8 bls. rags.
Phila. National Bank, Bellepline, Antwerp, 195 bls. rags.
E. Mayer, Bellepline, Antwerp, 187 bls. rags.
Old Colony Trust Co., Bellepline, Antwerp, 74 coils old rope.
Castle & Overton, Inc., Bellepline, Antwerp, 112 bls. rags.
True & McClelland, Bellepline, Antwerp, 17 bls. thread waste.
Katzenstein & Keene, Inc., Bellepline, Antwerp, 297 bls. bagging.
G. Mathes & Co., Bellepline, Antwerp, 86 bls. bagging.
Whaling Waste Products Co., Bellepline, Antwerp, 100 bls. jute waste.
Parsons & Whittemore, Inc., Vasaholm, ——, 500 bls. wood pulp; 1200 bls. sulphite; 300 bls. sulphate.

PORTLAND IMPORTS

WEEK ENDING FEBRUARY 15, 1930

Lagerloef Trading, Co., Korsholm, Viborg, 10611 bls. sulphite; 1836 bls. sulphate.
Lagerloef Trading Co., Korsholm, Kotka, 2585 bls. sulphate; 10271 bls. sulphite.

BOSTON IMPORTS

WEEK ENDING FEBRUARY 15, 1930

The Borregaard Co., Inc., Toronto, Bamble, 300 bls. sulphate.
Bank of New York, Toronto, Halden, 1710 bls. sulphite.
Atterbury Bros. Inc., Toronton, Halden, 690 bls. sulphite.
J. Andersen & Co., Toronto, Greaker, 3420 bls. sulphite.
The Borregaard Co., Inc., Toronto, Greaker, 180 bls. sulphite.
O. E. Kiaer, Toronto, Greaker, 250 bls. sulphite.
Walker, Goulard, Plehn Co., Toronto, Greaker, 10 cs. greaseproof paper.
Atterbury Bros. Inc., Toronto, Drammen, 375 bls. wood pulp.
O. E. Kiaer, Toronto, Drammen, 500 bls. wood pulp.
Atterbury & McKelvey, Toronto, Tofte, 450 bls. sulphite.
The Borregaard Co., Inc., Toronto, Hurum, 168 bls. sulphate.
Atterbury Bros. Inc., Toronto, Oslo, 600 bls. sulphate.
O. E. Kiaer, Toronto, Oslo, 2200 bls. sulphate.
Pagel, Horton & Co., Inc., Modemi, Gefle, 3750 bls. wood pulp 710 tons.
Bulkley Dunton & Co., Modemi, ——, 875 bls. wood pulp, 177 tons.
Price & Pierce, Ltd., Modemi, Wallvik, 600 bls. sulphate, 100 tons; 11670 bls. sulphite, 1895 tons.
Forte, Dupee, Sawyer, Bellepline, Antwerp, 53 bls. rags.
Baring Bros. & Co., Bellepline, Antwerp, 3 bls. rags.
E. Butterworth & Co., Bellepline, Antwerp, 82 bls. flax waste.
Bird & Son, Bellepline, Antwerp, 125 bls. rags.
American Express Co., Bellepline, Antwerp, 260 rolls paper.
C. H Powell & Co., Bellepline, Antwerp, 24 rolls paper.
Draper & Co., Bellepline, Antwerp, 10 bls. rags.
Train Smith Co., Bellepline, Antwerp, 306 bls. rags.
Parsons & Whittemore, Inc., Vasaholm, ——, 180 bls. sulphite.

BALTIMORE IMPORTS

WEEK ENDING FEBRUARY 15, 1930

The Borregaard Co., Inc., Toronto, Bamble, 300 bls. sulpnate
J. Andersen & Co., Toronto, Greaker, 1620 bls. sulphite.
Parsons & Whittemore, Inc., Toronto, Drammen, 250 bls. sulphite.
Atterbury & McKelvey, Toronto, Tofte, 1950 bls. sulphite.
Bulkley, Dunton & Co., Toronto, ——, 400 bls. sulphate.
Atterbury Bros. Inc., Toronto, Oslo, 1700 bls. wood pulp.
——, Toronto, Oslo, 39 rolls news print.
Price & Pierce, Ltd., Modemi, Wallvik, 10476 bls. sulphite, 1796 tons; 5604 bls. sulphate, 934 tons.
J. Andersen & Co., Carplaka, Stugsund, 2400 bls. sulphate, 480 tons.
Bulkley, Dunton & Co., Carplaka, ——, 750 bls. sulphite, 150 tons.
Perkins, Goodwin & Co., Carplaka, Sundsvall, 500 bls. sulphite.
M. Gottesman & Co., Inc., Carplaka, Sundsvall, 1200 bls. sulphite.
Parsons & Whittemore Inc., Vasaholm,—— 450 bls. sulphate; 964 bls. sulphite.

NEWPORT-NEWS IMPORTS

WEEK ENDING FEBRUARY 15, 1930

The Borregaard Co, Inc., Toronto, Bamble, 1800 bls. sulphate.
The Borregaard Co., Inc., Toronto, Hurum, 1800 bls. sulphate.
Atterbury Bros. Inc., Toronto, Drammen, 1625 bls. wood pulp.
Atterbury & McKelvey, Toronto, Tofte, 450 bls. sulphite.

INCREASED FREIGHT RATES OPPOSED

ALBANY, N. Y., February 8, 1930.—Hearings were resumed this week before the Public Service Commission in the investigation of freight class rates within New York State with many of the prominent paper concerns of the district represented. Joseph A. Quinlan, traffic manager of the St. Regis Paper Company, and Wilbur LaRoe, of Washington, were among those at the gathering for the purpose of opposing the position taken by the railroads that they are entitled to arbitrary rates in Northern New York within the territory where they control rail transportation. Virtually the entire opening session was consumed taking the testimony of F. M. Larah, traffic manager of the Syracuse Chamber of Commerce. Commissioner George Lunn presided and it was announced that the hearings would consume the entire week due mainly to the large number of witnesses to be called.

The railroads proposed scales of rates up to 33 per cent in excess of the present rates for Northern New York at the hearing held recently and virtually all of the industries in the state are affected. The traffic manager of the Syracuse Chamber of Commerce filed exhibits showing commodities manufactured there, the volume of shipments to points within the state, the present scale of commodity rates together with the rates proposed by the carriers which he estimated averaged about a 30 per cent increase. D. G. Kibbey, traffic manager of the Albany Perforated Wrapping Paper Company, appeared before the commission at the opening session to oppose any increase.

The fight against the increased freight rates is being led by Associated Industries but most up-state cities including Rochester, Syracuse and Buffalo are represented and will submit a large amount of data before the commission, which has jurisdiction over the rates. The hearings join with the eastern rate case now before the Interstate Commerce Commission and the local body is now carrying on its investigaiton with a view to reporting before the federal organization renders a decision.

TAGGART BROS. STAFF CHANGES

OSWEGO, N. Y., February 8, 1930.—Announcement is made of the appointment of Theron A. Contryman to the position as general manager of the local branch of Taggart Brothers, following similar service at the Watertown plant. He has already assumed his new duties. Besides having charge of installation of machinery at Watertown he also held the post as experimental engineer with jurisdiction over the firm's plants at Herrings and Carthage. He succeeds Harry White at the Oswego plant, who has been transferred to Los Angeles where a new plant has recently been opened by Taggart Brothers. It was also announced that David Fleishman, formerly manager of the local plant, has been promoted to the position as district manager of the California territory.

F. J. SENSENBRENNER MADE DIRECTOR

F. J. Sensenbrenner, president of the Kimberly-Clark Corporation, Neenah, Wis., has been made a member of the board of directors of the Wisconsin Bankshares Corporation, of Milwaukee, Wis. The organization owns a group of banks in the principal industrial centers of Wisconsin.

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New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, February 19, 1930.

Conditions in the local paper market are fairly satisfactory. Demand for most of the various standard grades of paper is improving materially. Sales forces of the leading paper organizations have inaugurated an active and strenuous campaign for spring orders. Prices on practically all of the various grades are holding to previously quoted levels, without difficulty.

The situation of the news print market is practically unchanged. Statistics gathered by the News Print Service Bureau show that during January the Canadian mills operated 71.4 percent of rated capacity, the United States mills at 85.3 per cent and Newfoundland mills at 97.1 per cent. Stocks of news print paper at North American mills at the end of January totalled 47,932 tons, which was equivalent to 2.9 days' average production.

No radical changes have been reported in the paper board market. Box board prices are still unsatisfactory. Demand for fine papers is better than at this time a year ago and the market is exhibiting a strong undertone. Some improvement was also noticed in the coarse paper market and wrapping paper is going forward in good volume.

Mechanical Pulp

Trading in the ground wood market was moderately active. The output of domestic mechanical pulp has been somewhat restricted of late, due to unfavorable weather conditions. Production abroad has also been curtailed for some time past. Offerings are limited and prices continue steady to firm, with little talk of concessions around.

Chemical Pulp

Demand for both domestic and imported chemical pulp was rather light. However, producers are reported to be well sold ahead on most of the popular grades. Prices are practically unchanged. Imported easy bleaching sulphite is being offered at from $2.85 to $3.05, on dock, Atlantic ports. Domestic easy bleaching sulphite is selling at from $2.65 to $3.00, f.o.b. pulp mill.

Old Rope and Bagging

The old rope market is fairly steady. Domestic manila rope is now offered at from $4.25 to $4.50, while imported manila rope is selling at from $4.25 to $4.40. Mixed rope is moving in fair volume. The bagging market is rather spotty. Gunny is in persistent request. Scrap is only in moderate demand. Prices are practically unchanged.

Rags

More interest is being displayed by the paper mills in the domestic rag market. Offerings of cotton cuttings are about sufficient to take care of current needs. Roofing rags are going forward at a steady pace. Domestic rag quotations continue steady and practically unchanged. The foreign rag market is rather quiet, with dealers abroad still asking high prices.

Waste Paper

The paper stock market is showing signs of improvement. The higher grades of waste paper continue in normal request for the season, especially book stock and hard and soft white shavings. Inquiries for the lower grades of paper stock from the board mills are more numerous and trading should become livelier in the near future. Prices remain unchanged, in most instances.

Twine

Most of the business transacted in the twine market during the past week was along routine lines. With the approach of the spring shopping season, however, an expansion of trade is generally anticipated. Although there have been some reports of shading on extra desirable orders, due to keen competition, the schedule of prices is generally being well maintained.

DALHOUSIE MILL OPENING

There is some talk here over the announcement of a postponement of the opening of the new mill of the International Paper Company at Dalhousie, N. B. The mill, which has an initial capacity of 250 tons per day, to be increased later on to 500 tons, was scheduled to be opened on February 7, and elaborate preparations had been made to celebrate the occasion by ceremonies in which the Premier of the Province would be the leading figure. It is announced that unfavorable weather has caused a delay in the installation of the machinery, but gossip here is inclined to the belief that present conditions in the news print market may also be a factor. Every one in the industry realizes that an additional 250 tons of news print thrown on the market at the present time would have an undesirable effect. As already pointed out the mill was built under a hard-and-fast agreement with the Government of New Brunswick, made before the present crisis developed, and its operation is tied up with the costly power development on the St. John River. Activity contingent on the opening of the mill has been counted upon by the government to inaugurate a greater industrial era in the province, and it is certain that any delay will not be looked on favorably in political circles. It is an awkward situation, and of course the trend of gossip here may be all wrong.

BAUMGARTH CO. STARTS AT SOUTH BEND

The John Baumgarth Company has begun operations at its new plant on West Sample street, South Bend, Ind., manufacturing a large line of paper products. John Baumgarth, president, and a skeleton crew of the company's employees arrived from Chicago to assume charge. Operations in the South Bend plant will be limited at the present time and it may take several weeks to transfer all of the company's equipment from Chicago, where the company has been in operation for more than 20 years.

Approximately 400 men and women will be employed in South Bend after production gets under way and the number will be increased to 600 in a few months, according to Mr. Baumgarth. One-half of the building having a total of 125,000 square feet of space will be occupied by the L. P. Hardy Company of South Bend, which recently announced its merger with the Baumgarth Company. The Baumgarth Company will continue its operations in Chicago for some time since the transfer of all its equipment to South Bend without hindering production, will be fairly gradual. The company has representatives in all parts of the country. The factory is modern in every respect having daylight through a glass roof.

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50 Church St. New York

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, February 18, 1930.

BLANC FIXE.—The blanc fixe market is practically unchanged. Demand for both the pulp and the powder is seasonal. Prices remain unchanged. The pulp is quoted at from $42.50 to $45.00 per ton, in bulk, while the powder is selling at from 3¼ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—Demand for bleaching powder was moderately active during the past week. Shipments against contract are going forward in a routine manner. Prices are generally holding to schedule. Bleaching powder is still quoted at from $2.00 to $2.35 per 100 pounds, in drums, at works.

CASEIN.—Some improvement was noticed in the casein market. Domestic casein is quoted at from 14 cents to 16½ cents per pound, while Argentine standard ground is selling at from 14½ cents to 15 cents, and finely ground at from 15 cents to 15½ cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Steadiness prevails in the caustic soda market. The contract movement is well up to average. Prices are steady and unchanged. Solid caustic soda is quoted at from $2.90 to $2.95, and the flake and the ground at from $3.30 to $3.55 per 100 pounds, in large drums, at works.

CHINA CLAY.—The china clay market is in a strong position. Contract shipments are moving in good volume. Prices remain unchanged. Imported china clay is quoted at from $15 to $25 per ton, ship side, while domestic paper making clay is selling at from $8 to $13 per ton, at mine.

CHLORINE.—Reports of over-production have resulted in some weakness in the chlorine market. Demand is about normal and shipments against contract are proceeding at a steady pace. Chlorine is still offered at $2.50 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market was fairly steady and prices were practically unchanged. The grades of gum rosin used in the paper mills are quoted at from $8.10 to $8.70 per 280 pounds, in barrels, on dock. Wood rosin is selling at from $6.50 to $7.65 per 280 pounds, in barrels, at southern shipping points.

SALT CAKE.—Offerings of salt cake continue decidedly scarce. Demand from the mills is insistent and shipments against contract are going forward in heavy volume. Salt cake is still quoted at from $22 to $25 per ton, while chrome salt cake is selling at from $20 to $21 per ton, in bulk, at works.

SODA ASH.—Conditions in the soda ash market are fairly satisfactory. Offerings are amply sufficient to take care of current needs. The contract movement is normal for the season. Prices are steady. Contract quotations, in car lots, at works, are as follows: in bags, $1.32½; and in barrels, $1.55.

STARCH.—The starch market was fairly active during the past week. Shipments against contract are proceeding to the mills in satisfactory volume. Prices are holding to schedule. Special paper making starch is quoted at $3.82 per 100 pounds, in bags, and at $4.09 per 100 pounds, in barrels.

SULPHATE OF ALUMINA.—Supplies of sulphate of alumina are moving into consumption in normal volume for the season. Prices are holding to previously quoted levels. Commercial grades are quoted at from $1.40 to $1.55, and iron free at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is exhibiting a strong undertone. Prices are steady. Sulphur is quoted at $18 per ton, at mine, for 1,000 tons, or over, on yearly contracts, and at $20 per ton for any smaller quantity over the same period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market was along routine lines. Contract shipments are moving with regularity. Prices are unchanged. Domestic talc is quoted at from $16 to $18 per ton, in bulk, at eastern mines, while imported talc is selling at from $18 to $20 per ton, in bags, ship side.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	11.00	@38.00
Bonds	9.00	@53.25
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub sized	10.00	@15.00
Engine sized	8.00	@11.00
Book, Cased—		
S. & S. C.	6.00 @	7.50
M. F.	5.75 @	7.00
Coated and Enamel	7.50	@12.00
Lithograph	7.50	@12.00
Tissues—Per Ream—		
White No. 1	.75 @	1.00
Anti-Tarnish	1.35 @	1.90
Colored	1.00 @	2.00
White No. 2	.75 @	.80
Kraft	1.00 @	1.10
Manila	.75 @	.80
Kraft—		
No. 1 Domestic	6.00 @	6.50
No. 2 Domestic	3.87½ @	5.00
Southern	3.75 @	4.50
Imported	6.50 @	7.00
Manila—		
No. 1 Jute	9.00 @	9.25
No. 2 Jute	7.75 @	8.50
No. 1 Wood	4.75 @	5.25
No. 2 Wood	4.00 @	4.50
Butchers	3.75 @	4.25
Fibre Papers—		
No. 1 Fibre	5.00 @	5.50
No. 2 Fibre	4.75 @	5.25
Common Bogus	2.75 @	3.00
Screenings	3.00 @	3.25
Card Middles	4.00 @	5.00
Glassine—		
Bleached, basis 25 lbs.	13.00	@16.00
Bleached, basis 20 lbs.	15.00	@16.00

(Delivered New York)

News, per ton—		
Rolls, contract	62.00 @	—
Rolls, spot	62.00 @	—
Sheets	67.00 @	—
Side Runs	47.00	@52.00
Boards—per ton—		
News	37.50	@40.00
Straw	52.50	@55.00
Chip	35.00	@37.50
Binders' Boards	65.00	@70.00
Wood Pulp	80.00	@85.00
65 Test Jute Liner	45.00	@47.50
85 Test Jute Liner	50.00	@55.00
Sgl. Mla. Ll. Chip	47.50	@50.00

Mechanical Pulp

(On Dock)

No. 1 Imported—		
Moist	30.00	@32.00
Dry	32.00	@34.00

(F. o. b. Mill)

No. 1 Domestic	28.00	@32.00
Screenings	15.00	@20.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	3.30 @	4.25
Easy Bleaching	2.85 @	3.05
No. 1 strong unbleached	2.65 @	2.75
Mitscherlich unbleached	2.70 @	3.00
No. 2 strong unbleached	2.40 @	2.60
No. 1 Kraft	2.35 @	2.50
No. 2 Kraft	2.30 @	2.40
Sulphate—		
Bleached	3.40 @	3.85

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	3.20 @	4.75
Easy Bleaching Sulphite	2.65 @	3.00
News Sulphite	2.50 @	2.70
Mitscherlich	3.00 @	3.25
Kraft (Domestic)	2.10 @	3.30
Soda Bleached	3.10 @	3.25
Sulphate Screenings—		
Coarse	.75 @	.95
Refined	1.65 @	1.85

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—		
New White, No. 1	9.50	@10.50
New White, No. 2	7.50 @	8.00
Silesias No. 1	7.50 @	8.00
New Unbleached	10.50	@11.00
New Blue Prints	5.25 @	5.50
New Soft Blacks	5.25 @	5.75
Blue Overall	7.25 @	7.75
Washables	4.75 @	5.25
Fancy	5.50 @	6.00
Mixed Khaki Cuttings	4.75 @	5.25
Pink Corset Cuttings	8.00 @	8.50
O. D. Khaki Cuttings	5.15 @	5.75
Men's Corduroy	3.75 @	4.25
New Mixed Blacks	3.50 @	3.75

Old Rags

White, No. 1—		
Repacked	5.50 @	6.00
Miscellaneous	4.50 @	5.00
White, No. 2—		
Repacked	3.00 @	3.50
Miscellaneous	2.50 @	2.75
St. Soiled, White	2.00 @	2.15
Thirds and Blues—		
Repacked	2.25 @	2.50
Miscellaneous	1.75 @	2.00
Black Stockings	3.25 @	3.75
Roofing Rags—		
Cloth Strippings	1.70 @	1.80
No. 1	1.70 @	1.80
No. 2	1.55 @	1.65
No. 3	1.30 @	1.40
No. 4	1.25 @	1.35
No. 5A	.90 @	1.00

Foreign Rags

New Rags

New Dark Cuttings	2.50 @	3.00
New Mixed Cuttings	2.75 @	3.25
New Light Silesias	7.00 @	7.50
Light Flannelettes	7.50 @	8.00
Unbleached Cuttings	10.00	@11.00
New White Cuttings	10.00	@10.50
New Light Oxfords	7.00 @	7.50
New Light Prints	5.50 @	6.50

Old Rags

No. 1 White Linens	7.25 @	8.00
No. 2 White Linens	5.75 @	6.75
No. 3 White Linens	4.75 @	5.25
No. 4 White Linens	3.00 @	3.50
No. 1 White Cotton	5.50 @	6.50
No. 2 White Cotton	4.50 @	5.50
No. 3 White Cotton	3.00 @	4.00
No. 4 White Cotton	2.00 @	2.10
Extra Light Prints	2.75 @	3.25
Ord. Light Prints	2.25 @	2.50
Med. Light Prints	1.95 @	2.10
Dutch Blue Cottons	2.20 @	2.35
French Blue Linens	2.75 @	2.85
German Blue Linens	2.35 @	2.55
German Blue Cottons	2.10 @	2.20
Checks and Blues	1.85 @	2.00
Lindsay Garments	1.85 @	1.95
Dark Cottons	1.50 @	1.55
Old Shopperies	1.45 @	1.50
New Shopperies	1.40 @	1.45
French Blues	2.10 @	2.25

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—		
Foreign	1.50 @	1.60
Domestic	1.60 @	1.70
Wool Tares, light	1.60 @	1.65
Wool Tares, Heavy	1.60 @	1.70
Bright Bagging	1.60 @	1.70
Small Mixed Rope	1.25 @	1.40
Manila Rope—		
Foreign	4.25 @	4.40
Domestic	4.25 @	4.50
New Burlap Cut	2.75 @	3.00
Hessian Jute Threads—		
Foreign	3.50 @	4.00
Domestic	3.25 @	3.50

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, white, No. 1	3.00 @	3.25
Hard, white, No. 2	2.40 @	2.55
Soft, White, No. 1	2.40 @	2.55
White envelope cuttings	2.90 @	3.10
Flat Stock—		
Stitchless	1.45 @	1.55
Overissue Mag.	1.45 @	1.55
Solid Flat Book	1.40 @	1.50
Crumpled No. 1	1.00 @	1.10
Solid Book Ledger	2.00 @	2.10
Ledger Stock	1.40 @	1.50
New B. B. Chips	.45 @	.55
Manilas—		
New Env. Cut	2.40 @	2.60
New Cuttings	1.50 @	1.75
Extra No. 1 old	1.25 @	1.35
Print	.60 @	.65
Container	.40 @	.50
Bogus Wrapper	.60c @	.65
Old Kraft Machine Compressed bales	1.65 @	1.75
News—		
No. 1 White News	1.65 @	1.75
Strictly Overissue	.55 @	.65
Strictly Folded	.45 @	.55
No. 1 Mixed Paper	.25 @	.30
Common Paper	.15 @	.65

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Twines
(F. o. b. Mill)

Cotton—			
No. 1	.39	@	.40
No. 2	.37	@	.38
No. 3	.36	@	.37
B. C., 18 basis	.38	@	.40
A. B. Italian, 18 basis	.48	@	.53
Finished Jute—			
Dark 18 basis	.24	@	.25
Light 18 basis	.27	@	.28
Jute Wrapping, 3-6 Ply—			
No. 1	.19	@	.21
No. 2	.18	@	.20
Tube Rope—			
4-ply and larger	.16	@	.17
Fine Tube Yarn—			
5-ply and larger	.21	@	.25
4-ply	.25	@	.29
3-ply	.28	@	.32
Unfinished India—			
Basis	.13	@	.14
Paper Makers Twine Balls	.11	@	.12
Box Twine, 2-3 ply	.15	@	.17
Jute Rope	.17	@	.19
Amer. Hemp, 6	.29	@	.31
Sisal Hay Rope—			
No. 1 Basis	.16	@	.18
No. 2 Basis	.14	@	.16
Sisal Lath Yarn—			
No. 1	.14	@	.16
No. 2	.12	@	.14
Manila Rope	.22	@	.24

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¾	@	.11
Superfine writing	.18	@	.24
No. 1 fine writing	.14	@	.18
No. 2 fine writing	.12	@	.14
No. 3 fine writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	.06¼	@	.06½
Southern Kraft	4.25	@	4.50
No. 2 Kraft	.04	@	.04¼
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue—			
24x36 Sheet	.07	@	.07¼
White Tissue—			
20x30 Sheet (Delivered Central Territory)	.07¼	@	.07½
News, per ton—			
Rolls, contract	62.00	@	—
Sheets	67.00	@	—
Boards, per ton—			
Plain Chip	37.50	@	42.50
Solid News	47.50	@	—
Solid News	40.00	@	45.00
Manila Lined Chip	50.00	@	55.00
Container Lined—			
85 Test	65.00	@	70.00
100 Test	70.00	@	—

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.35	@	2.40
White Env. Cuttings	2.60	@	2.65
No. 1 Soft Shavings	2.10	@	2.15
No. 1 Mixed	.60	@	.70
No. 2 Mixed	.50	@	.60
Ledger & Writings	1.25	@	1.35
Solid Books	1.05	@	1.10
Blanks	1.60	@	1.65
Krafts	1.65	@	1.75
New Kraft Cuts	2.15	@	2.25
Manila Envelope Cuttings	1.75	@	1.80
Ex. No. 1 Manila	1.30	@	1.45
Print Manila	.60	@	.70
Folded News (over-issue	.60	@	.65
Old Newspapers—			
No. 1	.60	@	.65
No. 2	.50	@	.55
Mixed Papers—			
No. 1	.40	@	.50
Roofing Stocks—			
(F. o. b. Chicago, net cash)			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mills)

Bonds	.05	@	.40
Ledgers	.08	@	.40
Writings—			
Superfine	.12½	@	.18
Extra fine	.18	@	.22
Fine	.17	@	.26
Fine, No. 2	.15	@	.22
Fine, No. 3	.09	@	.20
Book, M. F.	.05	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.09	@	.16
Coated Lithograph	.07	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.04	@	.05½
Manila No. 2	.03	@	.04
No. 2 Kraft	.04¼	@	.05
No. 1 Kraft	.05	@	.06
Common Bogus (Delivered Philadelphia)	.03½	@	.04
News Print Rolls	62.00	@	—
Straw Board	52.50	@	70.00
News Board	37.50	@	38.50
Chip Board	32.50	@	35.00
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	75.00		
No. 2, per ton	70.00		
Carload lots	68.00	@	70.00
Tarred Felts—			
Regular	55.50	@	57.00
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.10½	@	.11
New White, No. 2	.07	@	.07½
Light Silesias	.07	@	.07½
Silesias, No. 1	.07	@	.09
Black Silesia, soft	.05	@	.05½
New Unbleached	.10½	@	.11
Washable, No. 1	.04½	@	.05
Blue Overall	.07½	@	.—
Cottons—According to grades—			
Washable, No. 2	.03	@	—
New Blue	.03	@	.03¼
Fancy	.05½	@	.06
New Black Soft	.05	@	.05¼
New Light Seconds	.02½	@	.03
New Dark Seconds	1.85	@	2.00
Khaki Cuttings—			
No. 1 O. D.	.05½	@	.05¾
No. 2 Mixed	.04½	@	.04¾
Corduroy	.03	@	.03½
New Canvas	.08½	@	.09
New Black Mixed	.03¾	@	.04½

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	3.50	@	4.00
Sisal Rope	1.50	@	—
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1, New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	3.20	@	3.25
No. 2 Hard White	2.75	@	3.00
No. 1 Soft White	2.80	@	2.90
No. 2 Soft White	1.80	@	1.90
No. 1 Mixed	1.50	@	1.60
No. 2 Mixed	.90	@	1.00
Solid Ledger Stock	1.85	@	1.90
Writing Paper	1.30	@	1.40
No. 1 Books, heavy	1.25	@	1.35
No. 2 Books, light	.90	@	1.00
No. 1 New Manila	2.40	@	2.50
No. 1 Old Manila	1.50	@	1.60
Print Manila	.40	@	.50
Container Manila	.25	@	.35
Old Kraft	1.60	@	1.70
Common paper	.15	@	.20
No. 1 Mixed Paper	.15	@	.20
Straw Board, Chip	.40	@	.50
Binders Board, Chip	.35	@	.45
Overissue News	.60	@	.70
Old Newspaper	.25	@	.30

Domestic Rags (Old)

White, No. 1—			
Repacked	4.25	@	4.50
Miscellaneous	3.50	@	3.75
White, No. 2	2.00	@	2.25
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.60	@	1.80
Black Stockings (Export)	3.90	@	4.25
Roofing Stock—			
Foreign No. 1	1.65	@	1.75
Repacked	.01½	@	.01½
No. 2	1.20	@	1.25
No. 3 (Roofing)	1.10	@	1.20
No. 4	1.00	@	1.15
No. 5A	.75	@	.85
B	.65	@	.75
C	.65	@	.75

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.12½
Rag content	.15	@	.30
All rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.06¼	@	.06½
No. 2 Kraft	.03¼	@	.05
Common Bogus (Delivered New England points	.02	@	.02¼
News Print Rolls	61.50	@	—
Straw Boards, rolls .009			52.50
Straw Board in Sheets, basis 35s to 70s	54.50	@	55.00
Filled News Board	37.50	@	40.00
Chip Board	35.00	@	37.50
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated Newsboard			
Bender	65.00	@	80.00
Wood Pulp Board	75.00	@	80.00
Binder Boards	70.00	@	75.00

(F. o. b. Mill)

Tarred Felts—			
Regular, carload lots	65.00	@	—

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	3.25	@	3.75
No. 2 Hard White	2.60	@	2.90
No. 1 Soft White	2.40	@	2.50
No. 1 Mixed	1.10	@	1.15
No. 2 Mixed	.85	@	.90
Solid Ledger Stock	2.35	@	2.45
No. 1 Books, Heavy	1.50	@	1.55
No. 1 Books, Light	—	@	1.15
Manila Env. Cuttings	2.00	@	2.25
No. 1 Old Manila	.90	@	1.00
White Blank News	1.60	@	1.70
Old Kraft	—	@	1.50
Print Manila	.80	@	.90
No. 1 Mixed Paper	27.50	@	—
Overissue News	.45	@	.55
Old Newspapers	.45	@	.50
Box Board, Chip	.45	@	.50

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	1.40	@	1.55
Manila Rope—			
Foreign	—	@	4.40
Domestic	—	@	4.50
Transmission Rope	—	@	2.75
Mixed Strings	.90	@	1.00
Jute Wool Strings	1.00	@	1.05
Jute Carpet Threads	1.05	@	1.15
Scrap Burlaps	—	@	1.35
Scrap Sisal	1.55	@	1.75
Scrap Sisal for shredding	1.75	@	2.00
Wool Tares, heavy	1.60	@	—
New Burlap Cutting	1.90	@	2.00
Australian Wool Pouches	3.00	@	3.12½

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.08½	@	—
Silesias, No. 1	.06	@	.06¼
New Unbleached	.09¾	@	—
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades			
Blue Overalls	.06¼	@	.06¾
New Black, soft	.04	@	.04¾
Khaki Cuttings	.04	@	.04¾
O. D. Khaki	.05	@	—
Corduroy	.03	@	.03¾
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	5.00	@	—
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.75	@	3.00
Thirds and Blues—			
Repacked	2.25	@	2.50
Miscellaneous	1.75	@	1.90
Black Stockings	—	@	4.00
Roofing Stock—			
No. 1	1.65	@	1.75
No. 2	1.40	@	1.50
No. 3	1.05	@	1.10
No. 4	1.10	@	1.15

Foreign Rags
(F. o. b. Boston)

Dark Cottons	1.45	@	1.50
New No. 1 Shirt Cuttings	9.00	@	9.50
Dutch Blues	2.00	@	2 12½
Lace Curtains	4.75	@	5.00
New Checks & Blues	4.25	@	4.60
Old Fustians	1.90	@	2.00
Old Linsey Garments	1.85	@	1.90

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.12½	@	—
No. 2 Sulphite	.10¾	@	—
No. 1 Colored	.13½	@	—
No. 2 Colored	.11¼	@	—
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	7.50	@	—
No. 2 M. F. (carloads)	7.25	@	—
No. 3 M. F. (carloads)	7.00	@	—
No. 1 S. C. (carloads)	8.00	@	—
No. 2 S. C. (carloads)	7.75	@	—
No. 3 S. C. (carloads)	7.50	@	—
No. 1 Coated and Litho	13.25	@	—
No. 2 Coated and Litho	12.25	@	—
No. 3 Coated and Litho	11.50	@	—
Coated tinted	14.50	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.80	@	—
No. 1 Manila	6.65	@	—
Fiber	6.65	@	—
Kraft M. F.	7.00	@	—
M. G.	7.00		—

(Delivered Toronto)

News, per ton—			
Rolls (contract)	61.50	@	62.00
Sheets	67.00	@	—

Pulp
(F. o. b. Mill)

Ground Wood	31.00	@	32.00
Sulphite easy bleaching	60.00	@	—
Sulphite news grade	60.00	@	—
Sulphite, bleached	77.00	@	78.00
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	3.00	@	—
Soft White Book Shavings	2.85	@	—
White Blk. News	1.60	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.40	@	—
Light and Crumpled Book Stock	1.25	@	—
Ledgers and Writings	1.50	@	—
Solid Ledgers	1.50	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	1.00	@	—
Kraft	2.25	@	—
News and Scrap—			
Strictly Overissue	.85	@	—
Strictly Folded	.85	@	—
No. 1 Mixed Paper	.65	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09¼	@	.10
Fancy Shirt Cuttings	.06	@	.06¼

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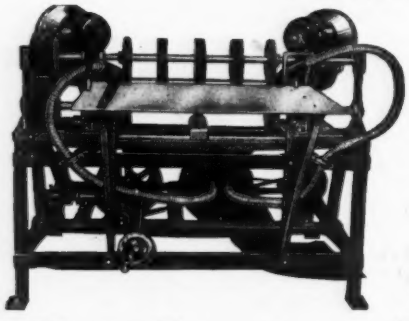

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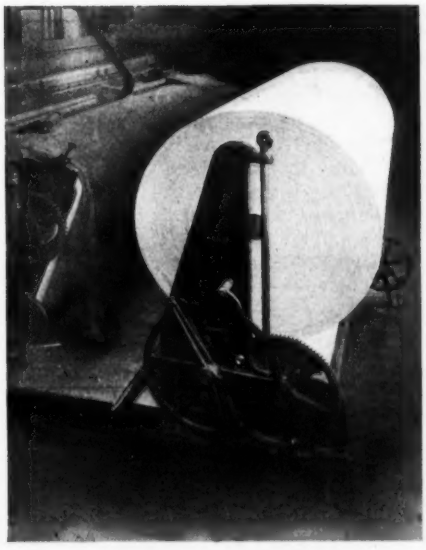

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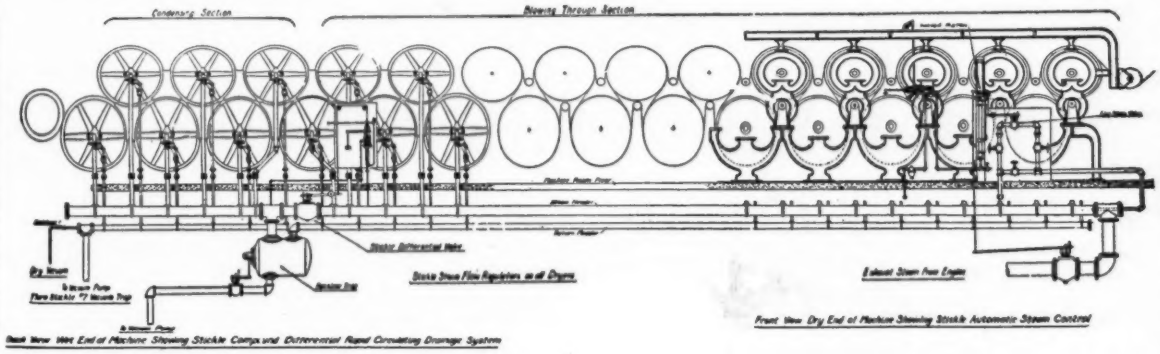

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Front View Dry End of Machine Showing Stickle Automatic Steam Control

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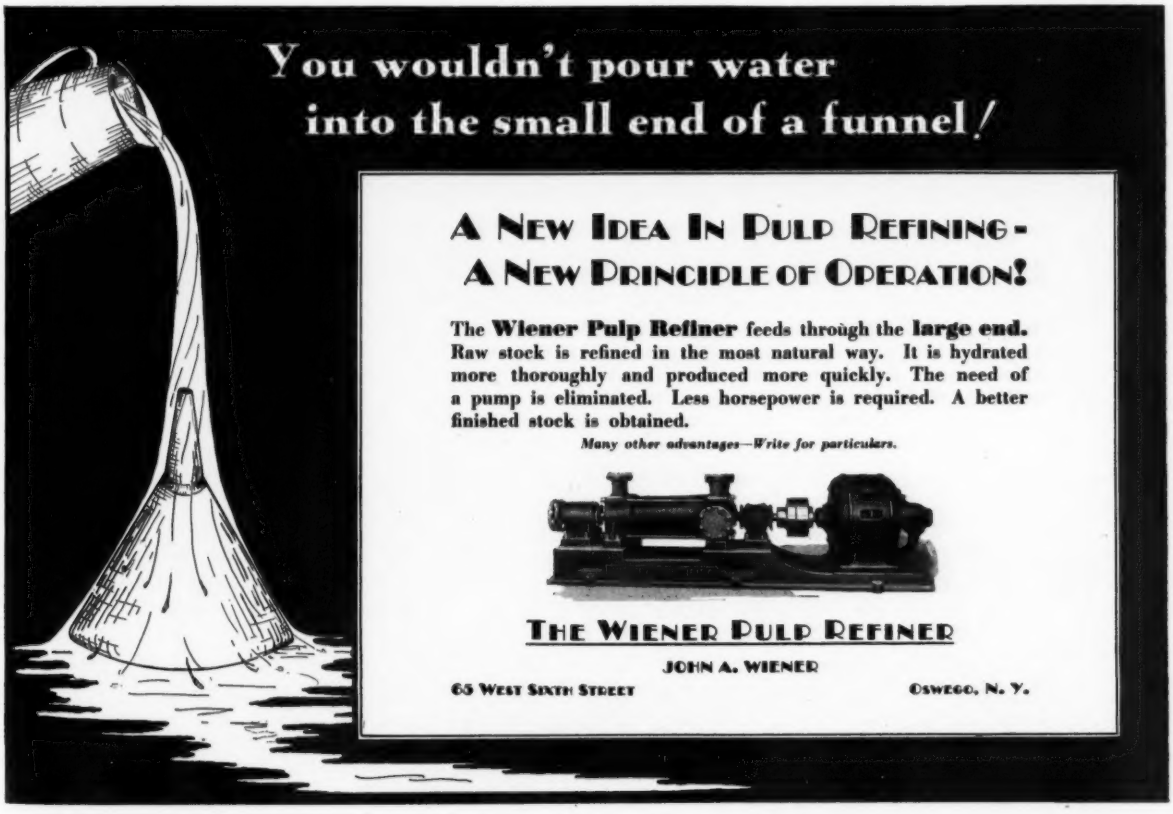
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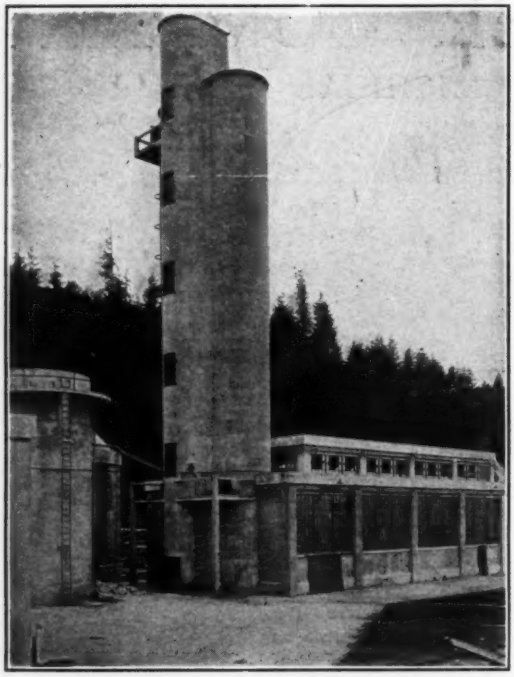

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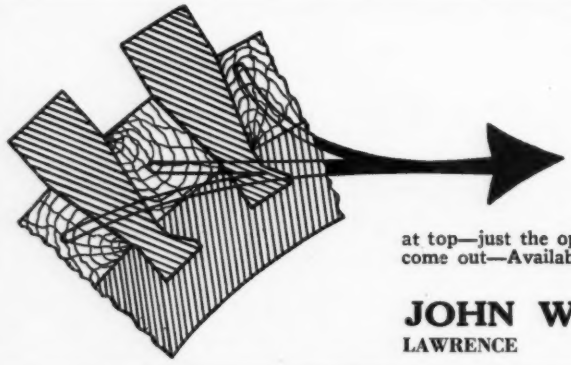

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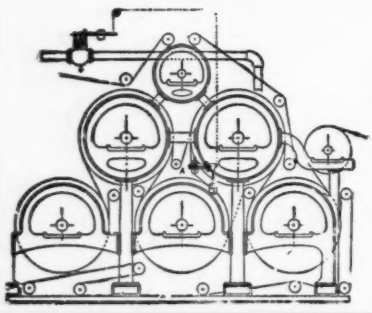

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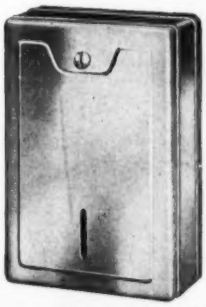

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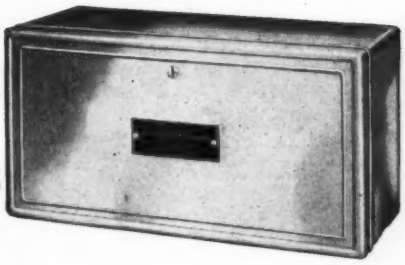

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FOURDRINIER WIRES

In brass, bronze and phosphor bronze, widths up to and including 250 inches.

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CYLINDER FACES
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EASTWOOD
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WIRES
EASTWOOD WIRE CORPORATION, BELLEVILLE N.J. U.S.A.

MORE WATER PER POUND OF PIPE
IN TAYLOR SPIRAL PIPE

THE LIGHT WEIGHT AND SPIRAL CONSTRUCTION OF TAYLOR SPIRAL PIPE ENABLES IT TO CARRY MORE WATER PER POUND OF PIPE THAN ANY OTHER FORM OF PIPING. THIS MEANS A REAL SAVING TO USERS OF TAYLOR SPIRAL PIPE, MADE IN SIZES 3" TO 42" DIAMETER AND LENGTHS UP TO 40' GALVANIZED OR ASPHALT COATED.

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Wood and Tile
TANKS
of every description by your industry's foremost tank builder. Why not call in a specialist?
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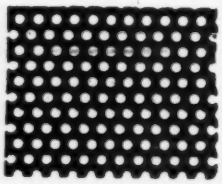
Perforated Metal Screens
For Pulp and Paper Mills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76%—Solid Liquid Flake
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Mill Cogs
ON SHORTEST POSSIBLE NOTICE

We make all kinds of Mill Cogs and have special facilities that will be of great service to you. We make a specialty of "ready dressed" cogs which are

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Supplies for Paper Manufacturers
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FORGE AND HAMMER LAP WELDED
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CUTTING COSTS A NEW WAY

Oils, Waxes, Solvents as used in this industry have the habit of taking on expensive names; of coming only from certain expensive sources.

If there is the least suspicion in your mind that the petroleum products you buy suffer from these habits, it will pay you to drop me a line. It won't cost you anything and it might save *thousands.*

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PAPER MAKERS' SUPPLIES
OLD AND NEW COTTON AND LINEN RAGS
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Hartzell
Airplane type
Ventilation

Bring all the well known efficiency of the airplane propeller principle to bear on ventilating problems. Scores of installations in paper machine rooms and elsewhere in the industry show far greater air movement than is possible with ordinary fans, coupled with phenomenal reduction in power costs.

Write
Hartzell Propeller Co. 4 *Craft St.*, Piqua, Ohio

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Finest Grades of Agalite
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PAPER TESTS
In Accord with T.A.P.P.I Standard Methods
Oils — Paper — Pulp Water — Microphotograph
Electrical, Mechanical, Physical, Chemical and Photometric Tests
ELECTRICAL TESTING LABORATORIES
80th St. & East End Ave., New York

USED BY MILLS MAKING OVER 80% OF THE COUNTRY'S PAPER
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AIR COMPRESSORS
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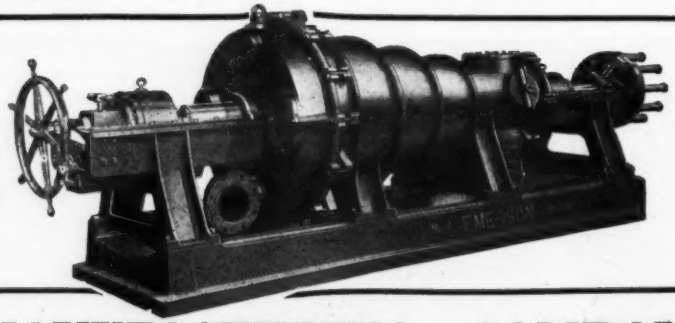
They cover their territory twice as often by Key Town Telephoning

A NATIONAL manufacturing company was faced with serious competition. Its salesmen could visit customers only months apart. A Key Town Plan of telephoning was presented and adopted. Its use enables the salesmen to cover their territory at least twice as often, at proportionately lower cost.

Many business men alternate personal visits with telephone calls. Out of town calls are *Quick . . . Easy . . . More economical than ever.*

Kraft—

Ask us for results obtained by mills using No. 4 Emerson Jordans equipped with the Bolton Inverted Wedge Plug and Timken roller bearings. Let us quote on your requirements.



THE EMERSON MANUFACTURING COMPANY
Division of John W. Bolton & Sons, Incorporated LAWRENCE - - - - MASSACHUSETTS

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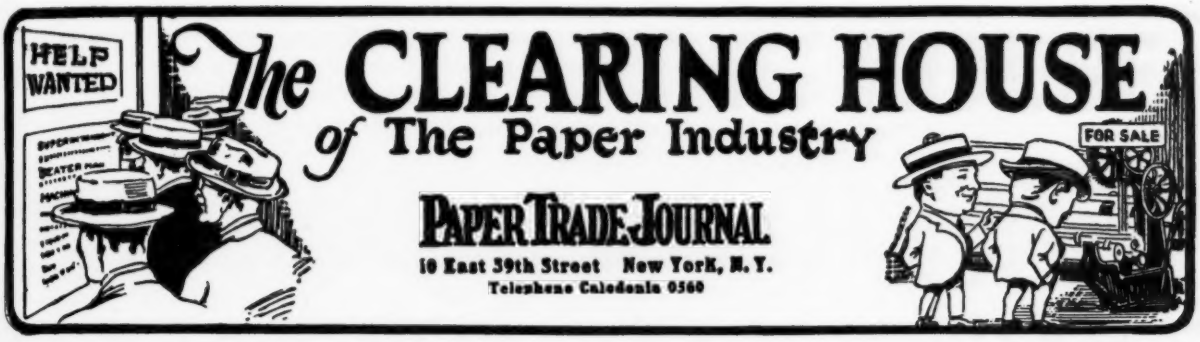

"SITUATIONS WANTED" ADVERTISEMENTS—4c a word, double rates for heavy face type. Minimum charge $1.00. If repeated ½ rate will be charged for each consecutive repetition.

"HELP WANTED" ADVERTISEMENTS—4c a word, double rate for heavy face type. Minimum charge $1.00.

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All classified "Help Wanted" and "Situation Wanted" advertisements are payable in advance.

HELP WANTED

MANAGERS, Superintendents, Chief Engineers, Chemical Engineers and other important men in the paper industry have been retaining us for ELEVEN (11) YEARS to negotiate new connections. All mill owners and officials know us and believe in us. Jacob Penn, Inc., 9 Park Place, New York. t.f.

IF YOU are open to overtures for new connection, and qualified for a salary between $2,500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service, of recognized standing and reputation, through which preliminaries are negotiated confidentially for positions of the calibre indicated. The procedure is individualized to each client's personal requirements; your identity covered and present position protected. Established twenty years. Send only name and address for details. R. W. Bixby, Inc., 117 Downtown Building, Buffalo, New York. tf.

WANTED—Millwright, for master mechanic of large chemical pulp mill. Must have forceful personality, be aggressive and capable of eventually developing into a first class general paper mill master mechanic. He must assume full responsibility for upkeep and efficient operation of pulp mill mechanical equipment, be capable in handling men, and willing to cooperate fully with operating foreman in securing best results. Give experience and qualifications in detail with age, starting wage, and references in first letter. Address, Box 30-95, care Paper Trade Journal. F-20

WANTED—Engineer salesman to sell machinery. East and west coast territory open. See classified column. MAYER COATING MACHINES CO., Rochester, N. Y. t.f.

COMMERCIAL ARTIST—Familiar with designing bread wrappers; must be acquainted with Black and Whites, engravers work, printing, and rotary presses. Only such need apply. Give age, experience, salary expected. Address, Box 30-91, care Paper Trade Journal. F-20

MECHANICAL ENGINEER—Experience in pulp and paper mills desired but not necessary. This party should be strictly a specialist in this profession. He should be able to handle every type of mechanical design and layout. State schooling, age, details of experience, salary expected, and when available. Address, Box 30-92, care Paper Trade Journal. F-27

SALESMAN—Highest quality house with acknowledged reputation desires man thoroughly experienced in selling bread wrappers. Must have established and select clientele among the large bakers. Give complete information in reply. Absolutely confidential. Address, Box 30-115, care Paper Trade Journal. M-6

WANTED—Machine tender for small board mill, operating on two shifts daily. Address, Box 30-129, care Paper Trade Journal. F-27

WANTED—Superintendent and tour boss, two machine board mill. Must have experience on jute liners and other grades box board. Address, Box 30-118, care Paper Trade Journal. F-20

WANTED—Producer of fancy finishes. Address, Box 30-119, care Paper Trade Journal. F-20

GUMMED PAPERS—Man fully acquainted with every detail in the manufacture of same. State experience, salary expected, nationality, married or single, reference. Address, Box 30-76, care Paper Trade Journal. M-6

STRUCTURAL ENGINEER—Must be familiar with all phases of construction work. Particularly mill building, re-enforced concrete and structural steel. Pulp and paper mill experience preferred but not essential. State schooling, age, details of experience, salary expected and when available. Address, Box 30-93, care Paper Trade Journal. F-27

MECHANICAL DRAFTSMAN—For machine drafting, general plant layout, pipe layout, equipment installation and process work. Experience in pulp and paper mills preferred but not necessary. State schooling, age, details of experience, salary expected and when available. Address, Box 30-94, care Paper Trade Journal. F-27

WANTED—Single man to do missionary work on coated book papers. Necessary to call on jobbing, printing and advertising trade throughout northeastern territory. Address, Box 30-61, care Paper Trade Journal. t.f.

WANTED—Paper salesman. Address, Box 30-115, care Paper Trade Journal. F-20

WANTED—Superintendent tablet manufacturing department; machine shop foreman who has had paper mill experience; tour engineer; color man; assistant treasurer and comptroller; tour boss. Charles P. Raymond Service, Inc., Paper Mill Department, 294 Washington St., Boston. F-20

WANTED—Shipping clerk and boss finisher for board mill making 180 tons per day. Middle west. Address, Box 30-116, care Paper Trade Journal. M-6

PRACTICAL OPERATOR WANTED—To assist research department in commercial studies on groundwood. Man must be familiar with stone dressing and able to eventually take charge of production. Address, Box 30-117, care Paper Trade Journal. F-27

MILLWRIGHT—Must be thoroughly familiar with paper machine and beater maintenance. State age, nationality, experience and send copies of references. Address, Box 30-130, care Paper Trade Journal. M-6

BEATERMAN—By southern mill making Kraft specialties. Must be good on colors. Address. Box 30-128, care Paper Trade Journal. F-20

CHEMIST—One who understands blending of sulphites and beating in specialty mill. Give full details of past experience, age and references. Address, Box 30-131, care Paper Trade Journal. M-6

SITUATIONS WANTED

SULPHITE SUPERINTENDENT—Practical, in maintenance of sulphite department and manufacturing of sulphite pulp. Slow cook digesters preferred. Reference furnished. Address, Box 30-64, care Paper Trade Journal. M-6

ENGINEER-MANAGER: Permanent position with good concern desired. Have seventeen years experience in manufacturing and sale of sulphate and sulphite pulps and papers. Address, Box 29-809, care Paper Trade Journal. M-6

YOUNG MAN wants position as assistant or night superintendent of sulphite, or sulphite chemist. 28 years of age, married, with ten years thorough practical and technical experience. Excellent references. Address, Box 153, Port Alfred, Quebec, Canada. F-20

COST AND ACCOUNTING EXECUTIVE—With paper industry experience, wants position in charge of costs and accounting. Nine years with large public accounting firm, five years comptroller large paper manufacturer. Wide experience in costs, budgetary control, and system planning and installation. Clear record. Excellent references. Address, Box 30-116, care Paper Trade Journal. M-6

BACKTENDER—18 years experience on Fourdrinier, Harper and Cylinder machines—would prefer Fourdrinier. Willing to go anywhere. Address, Box 30-72, care Paper Trade Journal. M-29

SUPERINTENDENT—Kraft and specialties; twisting cable filling; tissues, plain and creped, towels, napkins, all lines of creped paper products; converter crepes and waxing. Sixteen years experience. Best references. Address, Box 29-675, care Paper Trade Journal. M-6

CHIEF ENGINEER—Twenty years industrial construction, production and operation. Past fifteen years pulp and paper—structures, equipment, steam, hydro. Experienced conferences, preliminaries, organizing, preparing plans, estimates, specifications, negotiation contracts. Address, Box 30-122, care Paper Trade Journal. F-20

TOUR BOSS—Eighteen years practical experience on box boards, tag boards and specialties. References. Address, Box 30-11, care Paper Trade Journal. M-6

PRODUCTION MANAGER—Can increase production with practical modern methods. Experienced in efficiently scheduling operations and charting production. Address, Box 30-132, care Paper Trade Journal. M-6

PAPER MILLS FOR SALE

Lincoln Paper Mills, Elkhart, Indiana
3 Fourdrinier machines

Alexandria Paper Company, Alexandria, Indiana
2 Fourdrinier machines

American Tar Products Company, Rockton, Illinois
1-3 Cylinder machine

Rock Falls Box Board Company, Rock Falls, Illinois
Will sell this plant as a whole or in parcels

Shartle Brothers Machine Company
MIDDLETOWN, OHIO

SITUATIONS WANTED

COATING MILL SUPERINTENDENT—Open for position February 1st. Twenty-five years experience on all grades of coated papers. Address, Box 30-32, care Paper Trade Journal. M-6

PLANT ENGINEER—Technical and practical training in design, construction, maintenance and operation of groundwood and sulphite pulp mills, paper mill and steam power plants. 11 years connection as chief engineer and superintendent of construction. Age 37, married, available Feb. 1st. Address, Box 30-46, care Paper Trade Journal. t.f.

CHEMIST—Ten years in paper trade, four of which in paper mill. Special formulae and processes. Familiar with all types of mills. Age 38, with family. Address, Box 30-120, care Paper Trade Journal. F-27

SALESMAN—Connection desired with mill producing coarse papers, ground wood and sulphite. Have extensive following for mill that has machine 70" to 80". Address, Box 30-101, care Paper Trade Journal F-20

SALESMAN-EXECUTIVE: Age 35, many years broad experience with large manufacturer and jobber in sale of coarse papers, bags, toilet papers and specialties. Well trained for office or field, and accustomed to executive responsibility. Seeks connection with manufacturer or progressive jobber in any sales capacity. Highest credentials. Address, Box 30-97, care Paper Trade Journal. F-27

WORKING MASTER MECHANIC—Wide experience on construction, maintenance and rebuilding beaters to high speed, wishes position. Draftsman, A-1 mechanic and steam man. Address, Box 30-54, care Paper Trade Journal. M-17

WAXED PAPER EXECUTIVE, of wide experience in production and sales, prepared to negotiate services. Address, Box 30-60, care Paper Trade Journal. t.f.

FINISHING ROOM FOREMAN—16 years experience on book, bond, Kraft, tissue; modern machinery, calenders, shipping. References. Address, Box 30-123, care Paper Trade Journal. M-13

EDUCATIONAL OR PERSONNEL DIRECTOR, with extensive employment experience, plant educational training programs, foremanship training, also safety first experience, desires to make a change. Address, Box 30-124, care Paper Trade Journal. M-13

CHEMIST—University graduate with ten years practical experience in the chemistry of pulp and paper making. Highest credentials. Address, Box 30-67, care Paper Trade Journal. M-6

SALESMAN—Experienced in paper specialties and coarse papers, desires connection with mill. Highest references as to ability. Willing to travel. Address, Box 30-110, care Paper Trade Journal. F-27

ENGINEER with many years experience in pulp, paper and board mills, desires new position as plant or chief engineer. Address, Box 30-111, care Paper Trade Journal. F-20

SALESMAN—Experienced twenty years mill and selling, wants connection for New England with mill or mill agents handling or making coarse or printing papers. Commission or salary basis. Address, Box 30-102, care Paper Trade Journal. F-20

GENERAL SUPERINTENDENT, assistant, or manager. Young man, twenty years experience, familiar all branches sulphite pulp and paper manufacture. Well versed cost control, production, maintenance, steam and electric power. Address, Box 30-133, care Paper Trade Journal. M-6

THOROUGHLY EXPERIENCED board mill maintenance man desires position as master mechanic or maintenance foreman. Over twenty years experience in board mills. Best of references. Address, Box 30-134, care Paper Trade Journal. M-13

ROOFING and deadening felt mill superintendent desires connection with a good live mill. Good on production, repairs and quality. Best reference. Address, Box 30-136, care Paper Trade Journal. F-20

SITUATIONS WANTED

AVAILABLE MARCH 1ST—Plant superintendent. 20 years practical experience in both waxing and gumming papers and printing in all of its branches in connection with same. A high class executive whose record speaks for itself. For detailed information address Box 30-121, care Paper Trade Journal. M-6

TECHNICAL DIRECTOR OR ASSISTANT SUPERINTENDENT—Young man, member TAPPI, age 28, executive caliber; Harvard graduate in chemistry with four years diversified mill and laboratory experience; thoroughly grounded in technical control, development research, stuffs preparation; expert in analysis, manufacturing problems, and coloring. Experienced in fine papers, coarse papers, boards, and specialties. Highest credentials. Moderate salary. Address, Box 30-103, care Paper Trade Journal. F-27

YOUNG MAN OFFERS SERVICES in any capacity needed, to manager of wood supply for reputable paper mill. Experienced in practical pulpwood methods, and exceptionally qualified otherwise. Dependable, thorough, willing to learn. Would make first class personal assistant. Salary does not control. Best references. Address, Box 29-670, care Paper Trade Journal. F-27

MILL CONNECTION WANTED — Capable experienced salesman desires mill connection. Years of experience. Willing to travel. Highest credentials as to ability and integrity. Address, Box 29-566, care Paper Trade Journal. t.f.

COATING MILL SUPERINTENDENT—Thirty years experience on all grades coated papers. Twenty-five years in full charge of mills. Would like to get in touch with someone interested in locating a coating mill on the Pacific Coast. Can furnish the best of references as to integrity and ability. Address, Box 30-135, care Paper Trade Journal. M-13

PURCHASING AGENT—High grade man, 15 years experience mills operating diversified equipment making sulphate and sulphite specialties, folding box board, etc. Services available within 30 days. A-1 reference. Address, Box 30-65, care Paper Trade Journal. M-13

WANTED—Position by experienced tissue finisher. Years' experience on cutters and folders. Address, Box 30-96, care Paper Trade Journal. F-27

POSITION WANTED—Superintendent or foreman; chip board or wrapping mill. Experienced at construction and remodeling. Eastern states preferred. Address, Box 30-120, care Paper Trade Journal. F-27

FOR SALE

TOLHURST "CENTER-SLUNG" MOTOR DRIVEN HYDRO EXTRACTORS

Particulars:
60"—Basket Diameter
18"—Basket Depth
Steel Casing—3/32" thick Sheet Copper lined

Basket, Ring and Bottom of Bronze

Perforations—¼" on 1⅛" Centers

Speed of Basket:
Two Speed Operation—500 R.P.M. Max. and 85 R.P.M. Min.

Drive: Texrope from 2 Speed General Electric Motor, Frame No. R 513Y—1800—300 R.P.M. 3 Phase—60 Cycle—440 Volts A.C. General Electric Control CR7107K-4-CR-2940BS-13J—Push Button Station

These units have never been used and can be purchased in quantities up to eighteen units at prices substantially below their new cost.

For Full Particulars Write To:

Purchasing Agent
Celanese Corporation of America
Cumberland, Md.

This equipment may be inspected at the above address.

SITUATIONS WANTED

WANTED—Position as superintendent or foreman of mill making binders, leather and other boards. Middle-aged man. Good at construction and repairs. Address, Box 30-119, care Paper Trade Journal. F-27

SALESMAN-EXECUTIVE: Married, 25 years experience with mills and jobbers in fine papers, will consider running office in New York, or salesman for high class jobber. Capable of taking complete charge. Known to best New York houses. Address, Box 30-56, care Paper Trade Journal. F-20

FOR SALE

FOR SALE—30" New Model Kidder Slitter and Rewinder. Hardly used. Price less than half what it cost. Address, Box 30-118, care Paper Trade Journal. F-20

PAPER COATING MACHINERY—Waxing, Oiling, Gumming, Gluing, Asphalt Duplexing, Varnish Insulating, Pyroxlin compounds, etc. Laboratory Coating and Treating machines. High Speed, new improvement. MAYER COATING MACHINES COMPANY, Inc., Rochester, N. Y. t.f.

FOR SALE—Headquarters—Good Used Paper Machinery. Pulper Mixers, Wet Machines, Fourdriniers, Super-Calenders, Dryers, Cylinder Moulds, Coating Machines, Evaporators, Sulphur Burners, Tube and Rod Mills, Barkers, Beaters, Digesters, Grinders, Slitters, Shredders, Rotary, Flat and Pulp Screens, Save-Alls, etc. CONSOLIDATED PRODUCTS CO., INC., 15-18 PARK ROW, NEW YORK CITY. BARCLAY 0603 S-12

FOR SALE—Paper Mill consisting of wet machine equipment, suitable for binder's board mill. Located in Massachusetts, between Boston and Fall River. Address Box 29-556, care Paper Trade Journal. t.f.

FOR SALE—1—8'x9' Oliver Filter, splendid condition, used in board plant. 1 paper machine 68" trim; Dryers 36" x 86" and 36" x 90". 2—12-plate extra heavy Flat Screens. Cameron and Kidder Slitters and Rewinders, 24" to 82". 5 and 6-roll Calender Stacks, 96"—104" face. 9-roll Super Calender Stacks, 44-50", 38" face. 1—72" double press Rogers Wet Machine. 2—27" Wax Presses. 2—48" Wax Presses. Specially low prices on these particular items. Address, Box 30-40, care Paper Trade Journal. J-30

FOR SALE—Two 4' diam. x 8' long Glens Falls Rotary Sulphur Burners, complete with Combustion Chamber and Driving Mechanism. Good condition, low price. Address, Box 30-112, care Paper Trade Journal. F-6

Address Replies

to advertisements appearing under Box Numbers in care of

PAPER TRADE JOURNAL
10 East 39th St.,
New York, N. Y.

PAPER MILL MACHINERY

1—Cameron Slitter 62", type 8, model 5, rebuilt.

1—Fourdrinier Part, equipped with Millspaugh Suction Couch 18" diam. x 104" face.

1—Ryther & Pringle Shredder.

1—92" Norwood Dampener.

2—57" Norwood Glassine Super Calenders.

For Sale by:

FRANK H. DAVIS COMPANY
175 Richdale Avenue Cambridge, Mass.

FOR SALE

FOR SALE—American, Oliver and Sweetland Filters; Sulphur Burners; Tube and Rod Mills; Beaters; Grinders; Shredders; Wet Machines, etc. Send us your inquiries! Stein-Brill Corporation, 25 Church Street, New York, N. Y. F-20

FOR SALE—One (1) Hamilton Twin Corliss Engine, size 12" x 24", serial No. 3679-80. 4 to 1 Reeves variable speed control, 50 to 200 R.P.M., Steam pressure 160 lbs. Fly wheel 7'2" diameter, 30" face, weight 18.000 lbs. Floor space 15'6" x 11'6". One (1) Allis-Chalmers Corliss Engine, size 12" x 24", serial No. 490. Constant speed 130 R.P.M., 100 H.P., Steam Pressure 160 lbs., 2 pulley wheels, diameter 7'0" x 1'4" face and diameter 4'0" x 1'4" face. Floor space 4'0" x 15'0". Left hand engine, shaft extends 7'4" from main bearing. One (1) Split Flywheel, double spoke, double hub, double rim, diameter 16'0", total width of face 4'6", bore 14'7/8". Address, Box 30-126, care Paper Trade Journal. F-20

FOR SALE—Brownell steam, twin engine, No. 6232, size 14 x 16. P. O. Box 1043, Green Bay, Wisc. F-20

GOVERNMENT BIDS

GOVERNMENT BIDS

TREASURY DEPARTMENT, Bureau of Engraving and Printing, Washington, D. C., February 6, 1930.—Sealed proposals are invited to furnish dextrine, oils, textiles and dry colors during the fiscal year beginning July 1, 1930. The right is reserved to reject any or all bids or parts of bids. Samples must be received at the Bureau of Engraving and Printing not later than 2 p. m., March 24, 1930. Blank forms with specifications for proposals, giving dates on which the bids for the several schedules will be opened, and further information will be furnished on application to A. W. HALL, Director. F-20

TREASURY DEPARTMENT, Bureau of Engraving and Printing, Washington, D. C., February 13, 1930.—Sealed proposals are invited to furnish paper boxes, paper box blanks and paper, during the fiscal year beginning July 1, 1930. Samples must be received at the Bureau of Engraving and Printing not later than 2 p. m., Monday, March 24, 1930. Blank forms with specifications for proposals, giving dates on which the bids for the several schedules will be opened, and further information will be furnished on application to A. W. HALL, Director. F-27

MISCELLANEOUS

WHAT HAVE YOU TO OFFER?—We are interested in purchasing in quantities, odd lots of Kraft, news, imitation parchment and M. G. Kraft papers, rolls or sheets. Address, Box 29-696, care Paper Trade Journal. t.f.

WANTED—Side or odd lot rolls ten to ninety pound basis. The larger the quantity the better we like it. Address, Box 27-481, care Paper Trade Journal. t.f.

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WHAT HAVE YOU to offer in Lots, Mill Ends, Rejected, Damaged, or Cull Rolls of Paper? We deal only in such items and are in a position to buy any quantity on a cash basis. Goldman Paper and Paper Stock Co., N. W. Cor. 3rd and Wood Sts., Philadelphia, Pa. t.f.

WANTED—Formula for the manufacture of metallic or so-called indicator or ivory paper, with description of machines or equipment required for its production. Address, Box 30-127, care Paper Trade Journal. F-20

WE WILL PURCHASE any quantity of odd lots, sideruns and overruns, sheets and rolls, of tissue, toilet, Kraft, bonds, glassine, news and most other grades. What have you? Resolute Paper Products Company, 175 Fifth Avenue, New York City. e.o.w.t.f.

Address Replies

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PAPER TRADE JOURNAL
10 East 39th St.,
New York, N. Y.

WANTED

WANTED—2 W. & P. Pulpers, 2 Filter Presses and 1 Rogers Wet Machine. Address, Box 27-285, care Paper Trade Journal. t.f.

WANTED—Dietz Toilet Machine. Must be in perfect running order. Address, Box 30-59, care Paper Trade Journal. t.f.

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WANTED—One Duster for old paper stock to handle 100 tons mixed per day. Address, Box 30-107, care Paper Trade Journal. F-20

WANTED—A toilet winder, preferably 81". Must be in excellent condition and at low price. Also drum winding machine as above for hard wound rolls. Address, Box 30-125, care Paper Trade Journal. F-20

WANTED—1 Supercalender 86" face or wider. 2 or more Friction Calenders for finish on paper. 1 Rewinder, 82" and up. 1 paper machine 140" trim. Dryers, 24 to 36" diameter, 94 to 100" face. 1 Fourdrinier paper machine 80" or larger. 1 No. 2 Pulper. Address, Box 30-41, care Paper Trade Journal. F-13

PERSONAL

RELATIVES ARE SEEKING man by name "Panzel" from Hallein, Salzburg, Germany. Came to New York about 1893 to work at paper trade. Any information regarding his address will be appreciated. Arthur Krug, Box 247, Route 1, Norwood Park, Illinois. F-20

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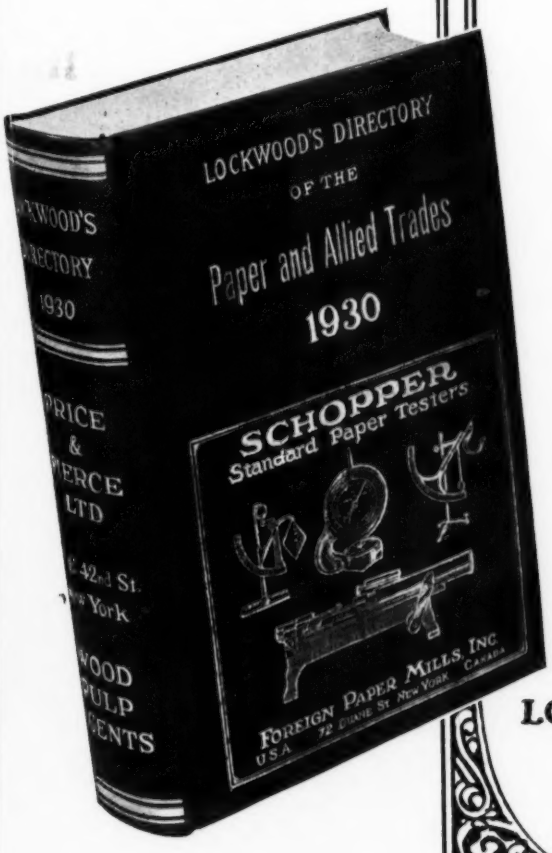

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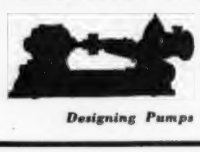
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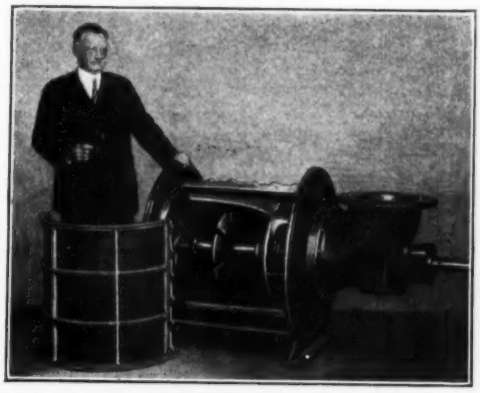

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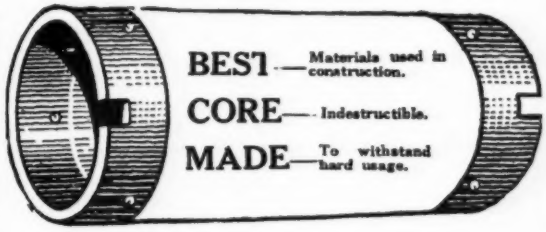

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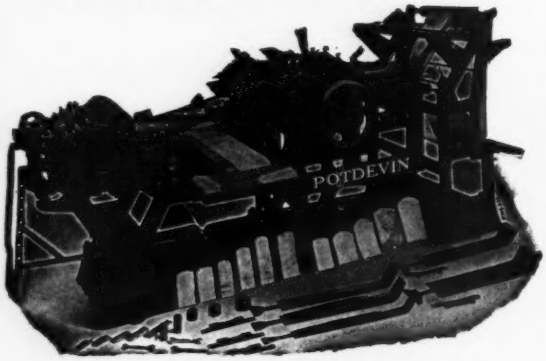

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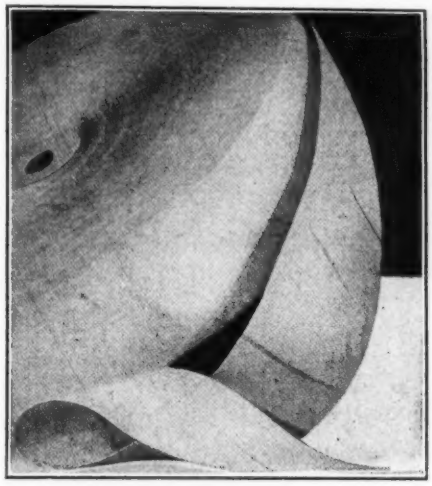

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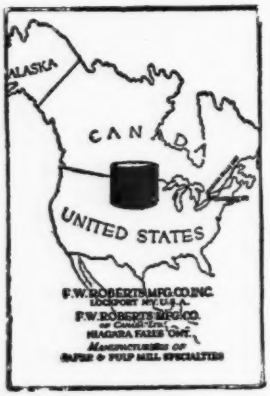

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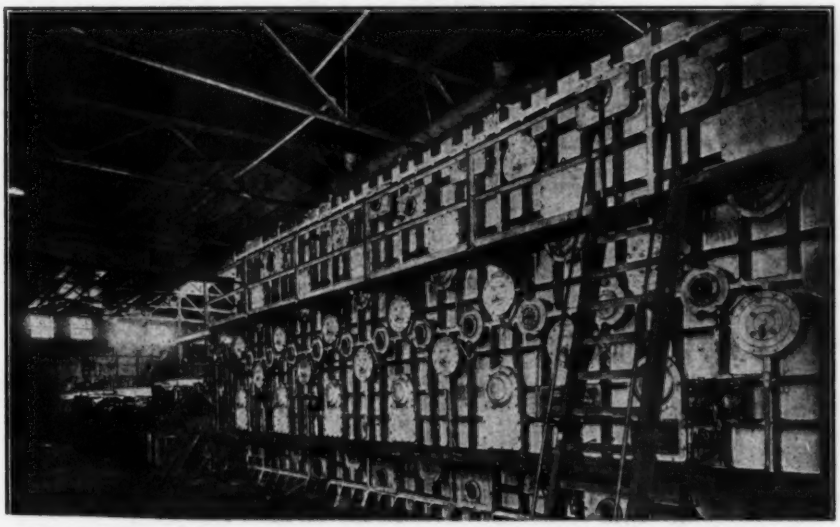

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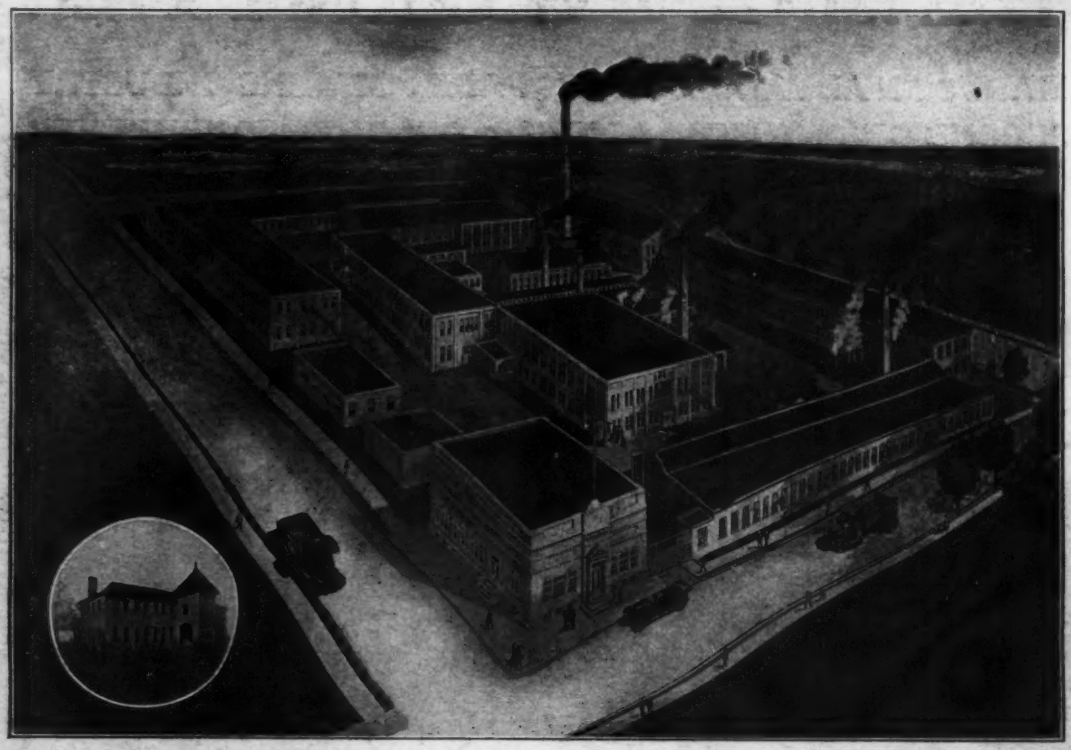

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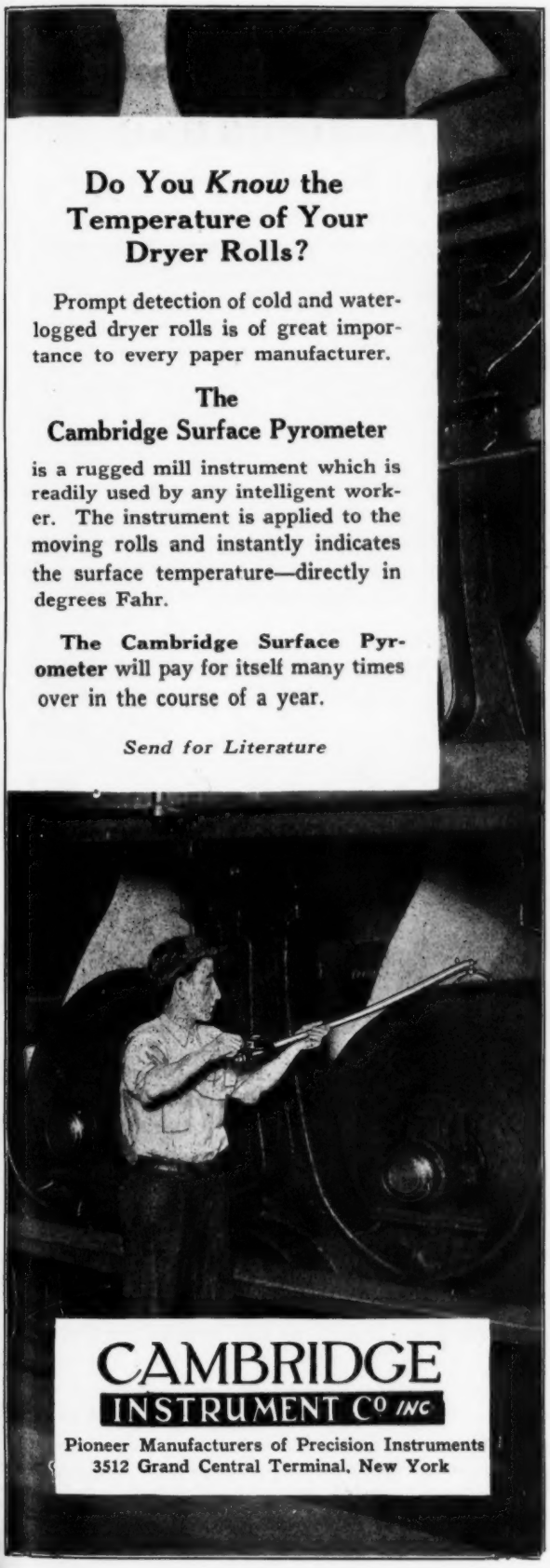

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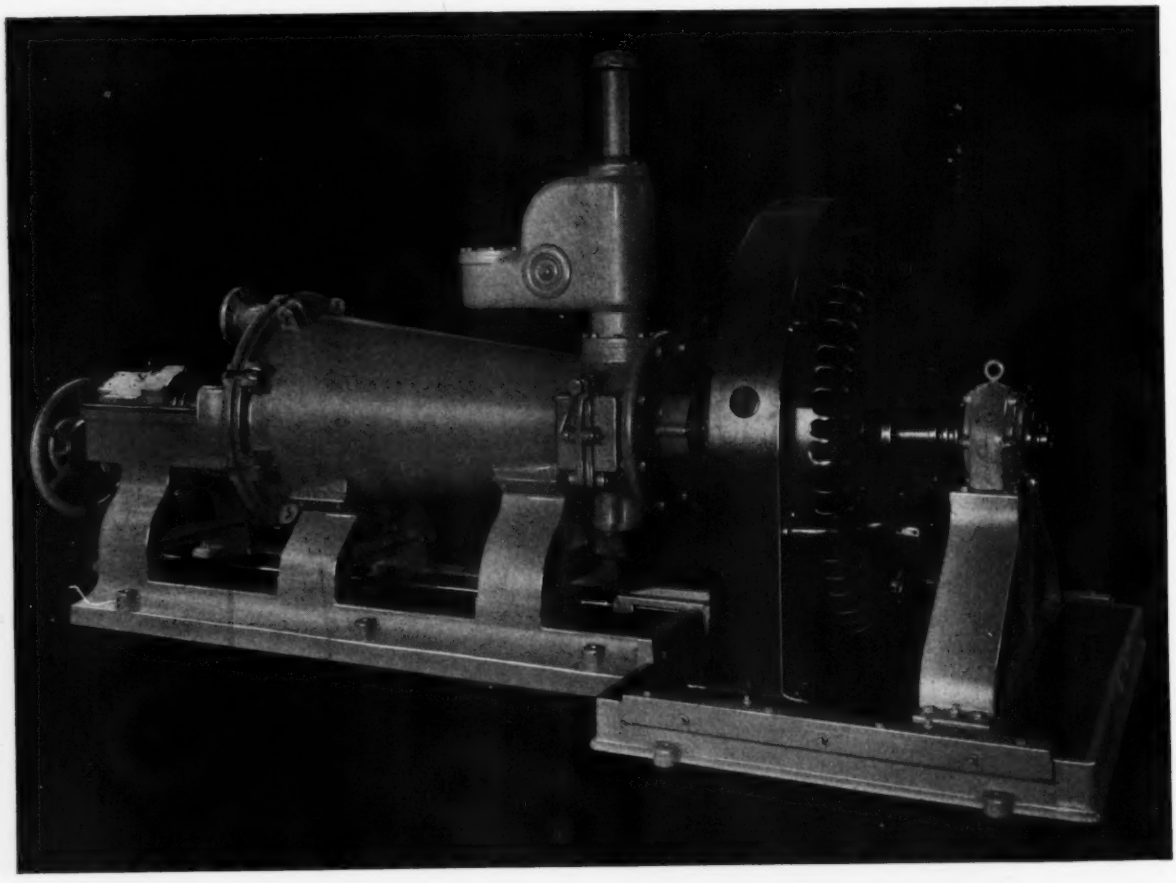

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